THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Rooms—No. 39 Nassau Street, cor. Liberty Street, opposite the Post-Office, New York.

VOL. V.—No. 89. NEW-YORK, TUESDAY, SEPTEMBER 1, 1863. $3 PER ANNUM.

PETROLEUM ITEMS.

OIL DIRECT FOR EUROPE.—Vessels are being loaded with petroleum in the harbor of Cleveland, Ohio, to sail direct for Europe. Parties in that city are now making arrangements to establish an "Oil Line" of vessels between Cleveland and Europe, with a view to avoid the expenses and losses consequent upon transhipment on other routes. Cleveland is a principal point for the refining of coal oil, and it is the only place within easy reach of the wells where the crude oil can be refined, and the refined oil loaded direct from the refineries on vessels that will take it, without transhipment, to the European markets. The oil trade of Cleveland has already attained great importance.

BURMESE PETROLEUM.—The people of Burmah are working their oil regions, and have recently brought to light upwards of eighty new and very productive wells.

THE LAMP TRADE.—Alluding to the lamp trade of England the *Oil Trade Review* thus remarks: A few month since, we called the attention of our manufacturers to the great scarcity of lamps adaped for burning hydrocarbon oils, and more especially to the want of a good supply of these lamps for the Continent. We are pleased to see that a wonderful, and, we may say, unprecedented activity now exists amongst the English makers. Lamps, countless in number, of all shapes and sizes, manufactured in every available material, and at any price from a shilling upwards, are now daily "turned out," as if by magic, from the monster establishments situate principally in and about Birmingham and Liverpool. Yet, so rapid is the increase in the consumption of mineral oils that all these lamps find a ready market, as their economy, when compared with gas or candles, is becoming better appreciated by housekeepers.

The inventive skill of some of our English makers has, in anticipation of this season's trade, been so well and successfully applied, that neither cottage nor mansion need now be without a really elegant lamp at a very small cost.

Our attention has been attracted to the new productions of many firms well known to the trade; for instance, the Paraffin Light Company have patented a most ingenious method for disposing of the unsightly reservoir which generally spoils the symmetry of a paraffin lamp. They have also in preparation the Patent Universal Night Light, Cooking, and Nursery Lamp,—a little wonder, intended to serve many purposes besides those enumerated in its somewhat lengthy title. Then we have the Colzarine Lamp, patented and introduced by Cassell, Smith & Co., adapted for burning heavy petroleum oils. Also, the same firm have introduced some new argand burners for the hydrocarbon oils generally, which are said to exceed in brilliancy of light any yet in use. This firm have just opened extensive warehouses in the city for supplying the trade with these lamps. We are informed that another firm, whose name we are not at liberty to mention, have been for months past, and are still engaged in the preparation of such a stock of lamps as will (if all promises are performed) surpass anything that has yet been witnessed in the trade.

Since our last issue we have also had the pleasure of a walk through Messrs. Defries and Son's sample-room, where a very elegant selection is displayed with an excellent idea of arrangement. In passing hastily over more than a thousand patterns and designs, we were particularly struck with a series manufactured from patent earthenware; some of them exceedingly handsome lamps, tastefully painted and enamelled in mosaic and floral patterns with gold lines; others are of the purest white, and have a very chaste appearance.

We notice that in the manufacture of these lamps a proper attention has been given to the construction of the base or stand, which, to insure safety, should always be broad, and, when not made of a heavy material, weighted, to prevent it being upset by any slight accident that may occur. Messrs. Defries are now manufacturing in large quantities a new bed-chamber lamp, to which they have given the appropriate name of the "Zephyr Night Light," a very convenient lamp in every respect. It is fitted with a round wick surmounted by a circular con. We have not had an opportunity of testing its exact illuminating power, but it gives a very brilliant and economic light, and with about one pennyworth of oil it burns for more than 24 hours without trimming. This useful lamp is sold to the trade at a moderate rate, and retailed at a good profit. We were also shown a collection of japanned petroleum lamps at almost nominal prices,—a very suitable article for the poorer classes, who have hitherto been obliged to content themselves with the wretched light of the common tallow candle, on account of the expense attending the fitting up of gas-pipes, and the usual etceteras. Indeed, the purposes for which this firm are making the various description of lamps are too numerous for us to mention. They have adapted them to the common hand lantern, the hall, the stable and even the street, being now engaged in lighting several important towns where gas has not been introduced, or where petroleum is preferred by the inhabitants.

[If the attention of the editor was so struck with what he saw in the sample-room of Messrs. Defries & Son, what would he say on being shown over the extensive warerooms of Messrs. Dietz & Co., of this city, or Messrs. Vankirk & Co., of Philadelphia. We venture to say that the stocks of these firms surpass almost everything of the kind in the world.—ED.]

CONFLAGRATION OF A PETROLEUM TRAIN.—A conflagration occurred at West Philadelphia, August 12th, which, says the *Inquirer*, for the novelty of its character and the splendor of the scene which it presented, has not been witnessed for many years. The Pennsylvania Railroad Company transport over their line an immense quantity of coal oil, which is taken from the oil wells west of the Alleghanies, and brought here on long trucks. The oil is contained in barrels of about the same size and dimensions as an ordinary whisky barrel. These cars are frequently left standing on the siding at West Philadelphia, and on the wharf at the western end of the permanent bridge. During Tuesday night, a train of cars freighted with oil reached the West Philadelphia station.

The cars were detached from the locomotive at the inclined plane, near the Round-house, and while the engine was turned into the Round-house, the cars in different sections were allowed to run on to the sidings near the bridge. One of these sections, when about half-way between the bridge and the Round-house, became disarranged, and switched from the main track on to a connecting line, colliding with two cars stationary on the same line. The barrels being hurled violently against each other, broke their fastenings, and the contents were spilled upon the car floors and ran upon the ground. The noise produced by the collision brought a number of employees of the road to the scene, and one, with an open lantern, entered the cars to investigate the cause of the confusion. Suddenly, a long trail of fire shot forth from the lantern, and communicating to the oil upon the floor of the car, in a moment the vivid flames were leaping over all the barrels in the car.

There were in all four cars on the side of the track, laden with coal-oil. This was in lots for shipment, comprising 227 barrels, and consigned part to Allen & Needles, and part to Messrs. J. M. Ellis & Son. These cars with their contents were entirely destroyed. On the same track were two coal cars filled with bituminous coal, which were badly burned; and two box-cars consigned to Baugh & Son, on Delaware avenue, laden with ground bone-dust, were totally destroyed. The fire happened at a point where the different lines of railroad form a perfect network, intersecting each other at every conceivable point. There were cars of all descriptions, empty and loaded, standing on all the connecting sidings, but the promptness of the neighboring citizens, soldiers, firemen, and railroad employees in hastening to the ground and removing the cars, succeeded in saving all but the six before adverted to. With great difficulty these cars were pushed up and down the road, on either side of the burning cars, some of them being removed while in a burning state. Water was obtained with great difficulty—for a time only one steamer being in service. As fast as cars were removed from the scene of danger, those that were on fire were followed up by the firemen, and a stream of water was thrown upon them.

The lantern from which the fire originated, it is stated by the men who used it, was never in contact with the oil. The vapor arising from the mass of coal-oil which was running over the tanks formed the medium of communication between the flames of the lantern and the inflammable oil. The hands on the car instantly leaped to the ground and escaped with slight burns.

As the barrels caught fire they exploded, one by one, scattering the staves and masses of burning oil in all directions, which ignited everything with which they came in contact. The reports of the bursting barrels were loud and penetrating, and contributed much to the excitement and interest of the occasion.

A scene of more surpassing grandeur seldom has been witnessed than was presented by the blazing trucks in the calm quiet of the morning. The train of cars were enveloped in a sheet of flame of blinding brightness. The thick, dense volumes of smoke rolled up from the burning surfaces, while mingling with them and flashing through them were vivid wreaths of fire which rose far above the ex-candescent mass, casting a garish glare upon the surrounding fields, revealing clearly every object for several squares.

The Pennsylvania Railroad have sustained a loss of $5,000 from the effects of the fire, and the damage to other parties will be about the same. Had not the exertions of the firemen and citizens been so constant and well directed, the flames would have spread to the adjacent property, in which case the loss would have been irreparable.

ILLUMINATION.—The officers of the Brooklyn, N. Y., Gas-Light Company have made arrangements for a grand illumination of their buildings in Remsen street, to take place when it shall be officially announced that the flag of the Union waves over the city of Charleston. The gas was lighted temporarily a few evenings since to observe the effect, which was said to be very satisfactory.

GAS-LIGHT COMPANIES IN THE UNITED STATES.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1857	ADRIAN	Mich.	50,000	50	—	May & November.	4,000	3 50	....	....	
1856	AKRON	O.	20,000	33⅓	—	Do.	3,500	3 00	...	...	
1845	ALBANY	N. Y.	25 ,000	20	4	January & July.	65,000½	3 00	120	....	None in market.
1858	ALBION	N. Y.	30,000	100	—	Do.	3,000	3 80	....	....	
1851	ALEXANDRIA	Va.	106,580	—	—	City Works.	9,000	3 50	....	....	
1852	ALLEGHANY	Pa.	200,000	25	4	May & November.	25,000	3 00	....	....	
1853	ALLENTOWN	Pa.	60,000	100	3½	Do.	5,000	3 50	....	....	
1857	ALTOS	Ill.	75,000	—	—	Private Works.	4,000	3 50	....	....	
1859	ALTOONA	Pa.	40,000	20	4	January & July.	5,000	3 00	....	....	
1859	AMESBURY AND SALISBURY	Mass.	150,000	25	—	Do.	7,000	4 00	....	....	
1858	ANNAPOLIS	Md.	100,000	25	—	Do.	4,000	4 00	....	....	
1858	ANN ARBOR	Mich.	23,000	50	5	March & September.	5,500	4 00	....	....	
1858	ASTORIA	N. Y.	20,000	50	—	Do.	6,000	4 00	....	....	
1855	ATLANTA	Ga.	50,000	25	5	January & July.	12,000	5 00	....	....	
1857	ATTLEBORO'	Mass.	6,000	50	3	Do.	2,000	6 00	....	....	
1850	AUBURN	N. Y.	80,000	50	5	Do.	10,000	7 00	....	....	
1851	AUGUSTA	Ga.	80,000	25	8	Do.	9,000	6 00	....	....	
1848	AUGUSTA AND HALLOWELL	Me.	84,700	50	5	Do.	10,000	4 00	....	....	
1860	AURORA	Ind.	10,000	—	—	Private Works.	3 500	3 50	....	....	Formerly used Sanders' Water-Gas. Recently altered to Coal Gas-Works.
1817	BALTIMORE	Md.	550,000	100	5	June & December.	150,000	2 50	150	....	None for sale.
1852	BANGOR	Me.	120,000	100	2½	January & July.	12,000	3 00	100	....	
1855	BATAVIA	N. Y.	32,000	20	4	Do.	2,500	4 00	....	....	
1853	BATH	Me.	65,000	100	3	April & October.	10,000	3 75	....	...	
1859	BATH	N. Y.	115,000	50	—	May & November.	3,000	7 00	....	....	
1861	BATTLE CREEK	Mich.	15,000	—	—	January & July.			....	....	
1858	BELFAST	Me.	14,000	100	—	Do.	7,000	7 00	....	....	
1856	BELLEFONT	Pa.	20,000	25	2	Do.	3,500	4 00	....	....	
	BELOIT	Wis.	30,000	—	—	Do.	4,000	4 00	....	....	
1854	BETHLEHEM	Pa.	50,000	50	4	June & December.	2,000	3 20	...	....	
1859	BEVERLY	Mass.	40,000	100	—	January & July.	4,000	4 00	....	....	
1853	BINGHAMPTON	N. Y.	50,000	50	3½	Do.	10 000	4 00	....	....	
1859	BIRMINGHAM	Pa.	40,000	50	—	Do.	4,000	4 00	....	....	
1855	BLOOMINGTON	Ill.	40,000	50	—	Do.	6,000	4 00	....	....	
1858	BORDENTOWN	N. J.	50,000	25	3	June & December.	4,000	3 80	....	....	
1822	BOSTON	Mass.	1,000,000	500	5	Do.	130,000	2 25	....	....	
1859	BRATTLEBORO'	Vt.	21,000	—	—	Do.	3,000	4 00	....	....	
1851	BRIDGEPORT	Ct.	90,000	25	4	January & July.	10,000	4 00	90	....	Passed last dividend.
1857	BRIDGETON	N. J.	50,000	20	—	Do.	5,000	4 00	....	....	
1856	BRISTOL	Pa.	30,000	25	3	February & August.	3,000	4 00	....	....	
1855	BRISTOL	R. I.	35,000	50	2	January & July.	6,000	4 00	....	....	
1859	BROCKPORT	N. Y.	25,000	100	3	Do.	1,500	4 00	....	....	
1858	BROOKLINE	Mass.	66,000	100	3½	February & August.	3,500	3 50	....	....	
1825	BROOKLYN	N. Y.	2,000,000	25	5	January & July.	75,000	2 50	170	160	
	BROWNSVILLE	Pa.				Do.			....	....	
1848	BUFFALO	N. Y.	600,000	50	5	Do.	70,000	2 90	140	125	
1852	BURLINGTON	N. J.	100,000	25	3½	Do.	5,000	4 00	105	....	
1858	BURLINGTON	Vt.	75,000	25	2½	Do.	10,000	4 50	....	....	
1859	BURLINGTON	Iowa.	65,000	50	—	Do.	8,000	4 00	....	....	
1861	CALAIS	Me.	90,000	100	—	Do.	10,000	3 50	....	....	
1852	CAMBRIDGE	Mass.	300,000	100	5	February & August.	20,000	3 50	100	97½	
1852	CAMDEN	N. J.	300,000	100	3	April & October.	15,000	3 50	105	100	
1853	CANANDAIGUA	N. Y.	50,000	50	—	January & July.	3,000	4 00	90	80	
1856	CANTON	O.	19,000	50	6	March & September.	6,000	3 00	....	....	
1858	CAPE ISLAND	N. J.	80,000	100	—	October.	10,000	6 00	....	...	Watering place.—These Works only run in summer.
1860	CARBONDALE	Pa.	16,000	25	—	March & September.	5,000	4 00	....	....	
1855	CARLISLE	Pa.	30,000	25	—	January & July.	4,000	4 00	....	...	
1856	CATASAUQUA	Pa.	15,000	25	5	May & November.	2,000	4 00	....	....	
1858	CATSKILL	N. Y.			—	Private Works.	3 000	3 00	....	....	Owned by G. T. Sutton.
1857	CHAMBERSBURG	Pa.	80,000	25	—	January & July.	3,000	4 00	....	....	
1846	CHARLESTON	S. C.	723,800	25	4	Do.	50,000	4 00	....	....	
1851	CHARLESTOWN	Mass.	200,000	50	4	Do.	80,000	3 00	105	...	
1858	CHARLOTTE	N. C.	14,000	50	10	March & September.	3,500	6 00	....	....	
1859	CHARLOTTEVILLE	Vt.	15,000	25	—	Do.	4,000	4 50	....	...	
1851	CHELSEA	Mass.	100,000	100	3½	January & July.	8,000	3 50	....	....	
1856	CHESTER	Pa.	35,000	25	3	April & October.	4,000	4 00	....	....	
1849	CHICAGO	Ill.	1,300,000	25	5	January & July.	100,000	2 50	150	140	Very scarce. Stock wanted.
1857	CHICOPEE	Mass.	50,000	20	—	Do.		4 00	....	....	
1851	CHILLICOTHE	O.	40,000	25	4	Do.	12,000	3 50	....	....	
1841	CINCINNATI	O.	1,600 000	100	5	Do.	225,000	2 50	....	....	
1859	CITIZENS', BROOKLYN	N. Y.	1,000,000	20	—	Do.	135,000	2 00	128	125	
1860	CITIZENS', READING	Mass.	90,000	100	—				....	....	
	CLARKESVILLE	Tenn.	100,000	50	—	Do.	5,000	4 00	....	....	
1860	CLAREMONT	N. H.	20 000	100	—	March & September.	3,000	4 00	....	....	
1846	CLEVELAND	O.	200,000	10	5	January & July.	20,000	3 00	....	....	
1858	CLINTON	Mass.	30,000	500	5	Do.	3,000	4 00	....	...	
1859	CLYDE	N. Y.	10,000	50	4	Do.	2,500	4 00	...	....	
1854	COHOES	N. Y.	50,000	20	3½	April & October.	5,000	3 60	....	....	
1860	COLD SPRING	N. Y.	30,000	50	—	Do.	3,500	4 00	80	....	Formerly Rosin-Gas, but now Coal. A well managed company. Stock firmly held.
1860	COLD WATER	Mich.	25,000	50	5	January & July.	4,000	4 00	....	....	
1852	COLUMBIA	Pa.	37,500	25	—	Do.	4,000	3 50	....	....	
1852	COLUMBIA	S. C.	44,000	25	4	Do.	6,000	6 00	....	....	
1857	COLUMBIA	Cal.	50,000	25	—	Do.	4,500	10 00	....	....	
1858	COLUMBUS	Ga.	54,000	25	5	Do.	5,000	7 00	....	....	
1850	COLUMBUS	O.	100,000	10	6	Do.	30,000	3 00	....	....	
1853	CONCORD	N. H.	50,000	50	5	Do.	8,000	3 50	....	....	
1-58	COVINGTON AND NEWPORT	Ky.	100,000	50	3½	Do.	28,000	4 00	..	....	
1854	CUMBERLAND	Md.	60,000	50	3	Do.	6,000	4 00	....	....	
1857	DANBURY	Ct.	50,000	25	4	Do.	2,000	3 75	....	...	
1856	DANVILLE	Pa.	30,000	25	—	June & December.	3,000	4 00	....	....	
1855	DAVENPORT	Iowa.	56,000	100	—	Do.	6,000	5 00	....	....	
1848	DAYTON	O.	50,000	25	5	February & August.	8,000	3 50	....	....	
1858	DEDHAM	Mass.	40,000	50	—	January & July.	3,000	4 00	....	....	
1860	DELAWARE	O.	30,000	25	—	Do.	2,500	3 00	....	....	
1849	DETROIT	Mich.	500,000	50	5	Do.	30,000	3 50	160	150	Excellent Stock. No sales.
1860	DOBBS' FERRY	N. Y.	25,000	—	—	Do.	3,000	4 00	....	....	
1854	DORCHESTER	Mass.	150,000	100	—	Do.	14,000	4 00	....	....	
1859	DOVER	Del.	12,000	—	—	Private Works.	2,000	4 00	....	....	
	DOVER	N. H.				January & July.			....	....	
1857	DOYLESTOWN	Pa.	50,000	—	—	Do.	3,000	4 00	....	....	
1854	DUBUQUE	Iowa.	100,000	50	—	Do.	17,000	4 50	....	....	
1853	EAST BOSTON	Mass.	133,000	25	4	Do.	20,000	3 50	....	145	No transactions.
1858	EAST GREENWICH	R. I.	11,200	100	15	Do.	3,000	7 00	....	...	
1861	EAST HAMPTON	Mass.	10,000	25	—	Do.	5,000	9 00	....	....	
1861	EAST NEW YORK	N. Y.	50,000	50	—	Do.	12,000	3 50	....	....	
1857	EASTON	Md.	9,000	10	—	Do.	1,500	7 00	....	....	
1850	EASTON	Pa.	125,000	50	4	June & December.	6,000	3 60	....	....	
1856	EASTPORT	Me.	50,000	55	—	Do.	3,000	4 00	....	....	
1855	ELIZABETH	N. J.	100,000	20	4	January & July.	14,000	3 50	....	....	
	ELLICOTT'S MILLS	Md.	10,000	—	—	Do.	4,000	4 00	....	....	
1852	ELMIRA	N. Y.	50,000	25	3½	Do.	5,000	4 00	....	...	
1852	ERIE	Pa.	168,000	50	3½	June & December.	10,000	3 00	....	....	
1858	EVANSVILLE	Ind.	160,000	50	4	January & July.	12,000	4 00	110	....	A very good Company.
	EXETER	N. H.	60,000	—	—	Do.	12,000		....	...	
	FAIR HAVEN	Ct.	20,000	25		Do.	8,000	4 00	....	....	
1847	FALL RIVER	Mass.	26,000	—	—	Private Works.	12,000	3 50	....	....	
1859	FAYETTEVILLE	N. C.	25,000	100	6	January & July.	7,000	6 00	....	....	
	FIFTH WARD (Milwaukee)	Wis.	50,000	25	—	Do.	10,000	4 00	...	....	
1857	FISHKILL	N. Y.	10,000	20	—	April & October.	1,500	9 00	....	....	
1858	FITCHBURG	Mass.	100,000	50	3	January & July.	5,000	4 00	....	....	Make Petroleum-Gas.
1859	FLEMINGTON	N. J.	20,000	—	—	Do.	3,000	4 00	...	....	
1855	FLUSHING	N. Y.	40,000	50	1½	March & September.	6,500	4 00	.	....	
1858	FORT WAYNE	Ind.	50,000	25	—	Do.	6,000	4 00	...	....	
1851	FRANKFORT	Ky.	30,000	—	—	City Works.	5,500	4 50	...	....	
1851	FREDERICK CITY	Md.	36,000	100	—	January & July.	5,000	6 70	....	....	
1854	FREDERICKSBURG	Va.	72,500	50	5	Do.	4,500	4 00	....	....	
1858	FREDONIA (Natural Gas)	N. Y.	10,000	100	—	Do.	2,000	4 00	....	....	Unlimited supply of Natural Gas.
1856	FREEPORT	Ill.	20,000	100	—	May & November.	10,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1859	FREMONT	O.	25,000	25	—	May & November.	2,000	4 50	....	....	
1858	FULTON	N. Y.	12,000	100	—	Do.	4,000	7 00	....	....	
1855	GALENA	Ill.	70,000	100	—	Do.	8,000	4 00	....	....	
1859	GALION	O.	25,000	25	—	January & July.	1,800	3 00	....	....	
1858	GALVESTON	Texas.	150,000	50	—	May & November.	7,000	6 00	....	....	
1854	GARDINER	Me.	100,000	50	4	Do.	8,000	4 00	....	....	
1853	GENEVA	N. Y.	75,000	25	2½	Do.	6,000	4 00	....	....	
1851	GERMANTOWN	Pa.	Merged	into	the	Philadelphia Works.	12,000	2 25	....	....	
1859	GETTYSBURG	Pa.	20,000	50	3	January & July.	2,500	4 00	....	....	
1854	GLENN'S FALLS	N. Y.	35,000	50	3	February & August.	4,000	4 00	....	....	
1854	GLOUCESTER	Mass.	40,000	50	—	January & July.	5,000	3 50	....	....	
1857	GLOVERSVILLE	N. Y.	15,000	25	—	Do.	3,000	3 50	....	....	
1858	GRAND RAPIDS	Mich.	50,000	20	—	Do.	3,000	4 00	....	....	
1855	GREAT BARRINGTON	Mass.	5,000	100	5	April & October.	2,000	7 00	....	....	
1849	GREAT FALLS	N. H.	50,000	100	3	Do.	3,000	4 00	....	....	
1860	GREENFIELD	Mass.	20,000	50	2	January & July.	2,500	4 00	....	....	Close corporation.
1853	GREENPOINT	N. Y.	100,000	50	5	Do.	20,000	3 00	....	....	
1859	GREENSBORO'	N. C.	12,000	50	—	April & October.	3,000	7 00	....	....	
1858	GREENSBURG	Pa.	30,000	25	3	May & November.	2,000	3 00	....	....	
1854	HAGERSTOWN	Md.	15,000	20	—	January & July.	2,000	6 00	....	....	
	HAMILTON	O.	15,000			Do.			....	....	
1859	HANNIBAL	Mo.	100,000	100	—	Do.	6,000	3 50	....	....	
1857	HARLEM	N. Y.	350,000	50	3½	Do.	25,000	3 00	....	145	
1855	HARRISBURG	Pa.	100,000	—	4	Do.	5,000	4 00	....	....	
1849	HARTFORD	Ct.	200,000	25	4	Do.	25,000	3 00	150	140	Stock in demand.
	HASTINGS	N. Y.				Do.	8,000	4 00	...	....	
1858	HAVERHILL	Mass.	50,000	50	—	Do.	5,000	4 00	....	....	
1859	HAVERSTRAW	N. Y.	20,000	100	—	Do.	5,000	4 00	....	....	
1861	HAYESVILLE	Mass.	15,000	25		Do.	4,000	4 00	....	....	
1859	HEMPSTEAD	N. Y.	16,000	25	—	Do.	1,000	4 00	....	....	
1862	HOBOKEN	N. J.	100,000	25	3	Do.	30,000	2 50	....	100	Works not yet built.
1856	HOLLIDAYSBURG	Pa.	30,000	25	2	Do.	4,000	3 50	....	....	
1861	HOLYOKE	Mass.	20,000	25	—	Do.	3,000	4 00	....	....	
1861	HOMER & CORTLANDT	N. Y.	40,000	100	—	Do.	6,000	4 00	....	....	
1854	HONESDALE	Pa.	30,000	25	3	Do.	2,500	4 00	....	....	
1860	HORNELLSVILLE	N. Y.	12,000	50	—	Do.	2,000	4 00	....	....	
1853	HUDSON	N. Y.	50,000	100	3½	February & August.	3,000	4 00	....	....	
	HUNTER'S POINT	N. Y.									
1857	HUNTINGTON	Pa.	18,000	50	3	Do.	2,000	3 50	....	....	
1856	HUNTSVILLE	Ala.	7,325	25	—	June & December.	2,000	5 00	....	....	
	INDIANAPOLIS	Ind.	150,000	—	—	Do.	15,000	5 00	....	....	
1857	IOWA CITY	Iowa.	40,000	50	—	February & August.	4,000	4 50	....	....	
1852	ITHACA	N. Y.	75,000	25	3½	January & July.	6,000	4 00	....	....	
1857	JACKSON	Mich.	25,000	50	5	Do.	6,000	3 50	....	....	
	JACKSON	Miss.	80,000	50	—	Do.	4,000	4 50	....	....	
	JACKSON	Cal.	50,000	30	—	Do.	4,000	10 00	....	....	
	JACKSONVILLE	Flor.	30,000	20	—	Do.	2,000	7 00	....	....	
	JACKSONVILLE	Ind.	50,000	50	—	Do.	4,000	5 00	....	....	
1858	JACKSONVILLE	Mo.	25,000	25	—	Do.	7,000	6 00	....	....	
1856	JAMAICA	N. Y.	20,000	—	4	Do.	6,000	4 00	....	....	
1853	JAMAICA PLAIN	Mass.	75,000	100	3½	Do.	3,000	3 50	....	....	
	JAMESTOWN	N. Y.	25,000	—	—	Do.	4,000	4 00	....	....	
1856	JANESVILLE	Wis.	50,000	100	—	Do.	12,000	4 00	....	....	
	JEFFERSONVILLE	Md.	30,000	25		Do.	4,000	4 00	....	....	
1858	JERSEY CITY	N. J.	300,000	—	5	Do.	30,000	3 00	150	....	No sales since formation of Hoboken Co.
1858	JERSEY SHORE	Pa.	15,000	25	—	Do.	2,000	3 70	....	....	
1856	JOHNSTOWN	Pa.	80,000	25	3	Do.	8,000	3 00	....	....	
1857	JOLIET	Ill	300,000	100	—	June & December.	6,000	4 00	....	....	
1858	KALAMAZOO	Mich.	30,000	50	5	Do.	10,000	4 00	....	....	
1860	KEENE	N. H.	60,000	100	—	Do.	4,500	4 00	....	....	
1855	KEOKUK	Iowa.	100,000	100	—	January & July.	10,000	4 50	....	....	
1855	KINGSTON	Pa.	50,000	50	—	Do.	8,000	4 00	....	....	
1859	KITTANNING	Pa.	20,000	—	—	Doubtful.	5,000	4 00	....	....	Said to be a fraud.
1854	KNOXVILLE	Tenn.	68,000	—	—	April & October.	4,000	5 00	....	....	
1860	LACONIA	N. H.	20,000	100	—	Do.	4,000	6 00	....	....	
1859	LA CROSSE CITY	Wis.	100,000	50	—	June & December.	10,000	5 00	....	....	
1854	LAFAYETTE	Ind.	60,000	50	4	January & July.	10,000	3 25	....	....	
1856	LAMBERTVILLE	N. J.	30,000	25	—	Do.	2,600	4 00	....	....	
1849	LANCASTER	Pa.	100,000	50	4	Do.	10,000	3 00	....	....	
1856	LANCASTER	O.	25,000	100	5	Do.	5,000	3 50	....	....	
1855	LANSINBURG	N. Y.	25,000	100	—	Private Works.	7,000	4 00	....	....	
1849	LAWRENCE	Mass.	200,000	100	4	February & August.	15,000	3 50	....	....	
1859	LEAVENWORTH	Kansas.	200,000	25	—	January & July.	10,000	5 00	....	....	
1856	LEBANON	Pa.	26,000	50	—	February & August.	5,000	4 00	....	....	
1861	LE ROY	N. Y.	25,000	50	—	Do.	4,000	4 00	....	....	
1858	LEWISBURG	Pa.	20,000	100	—	January & July.	4,000	4 00	....	...	
1852	LEWISTON	Me.	100,000	100	3	Do	10,000	3 20	....	....	
1856	LEWISTOWN	Pa.	30,000	50	3	April & October.	3,000	3 10	....	....	
1858	LEXINGTON	Ky.	100,000	25	4	January & July.	5,000	4 00	....	....	
1858	LITTLE FALLS	N. Y.	112,000	25	—	Do.	3,500	7 00	....	....	
1861	LITTLE ROCK	Ark.	20,000	—	—	Do.	5,000	6 00	....	....	
1858	LOCKHAVEN	Pa.	28,000	—	—	Do.	3,000	4 00	....	....	
	LOCKPORT	N. Y.	100,000	50	—	Do.	4,000	4 00	...	....	
1838	LOUISVILLE	Ky.	600,000	50	6	Do.	80,000	2 50	125	....	But $481,400 stock has been sold. This Company has a large contingent fund and undivided profit on hand.
1849	LOWELL	Mass.	200,000	25	5	Do.	50,000	3 25	....	....	
1852	LYNCHBURG	Va.	70,000	25	5	Do.	6,000	3 80	....	....	
1852	LYNN	Mass.	55,000	50	4	Do.	20,000	4 00	....	....	
1859	LYONS	N. Y.	30,000	100	—	Do.	4,000	4 00	....	....	
1852	MACON	Ga.	75,160	25	6	Do.	5,000	5 00	....	....	
1851	MADISON	Ind.	160,000	25	3	Do.	10,100	3 50	....	....	
1855	MADISON	Wis.	100,000	25	—	Do.	5,000	5 00	....	....	
1854	MALDEN & MELROSE	Mass.	50,000	25	3	February & August.	5,000	4 00	....	....	
1852	MANAYUNK	Pa.	40,000	100	—	Do.	7,000	4 00	....	....	
1852	MANCHESTER	N. H.	100,000	100	5	January & July.	25,000	3 00	....	....	
1880	MANHATTAN (N. Y. City)	N. Y.	4,000,000	50	5	Do.	600,000	2 50	300	275	
	MANSFIELD	O.	25,000	—	—	Do.	10,000	4 00	....	....	
1854	MARBLEHEAD	Mass.	40,000	100	3	Do.	1,000	4 00	....	....	
	MARLBORO'	Mass.	20,000	—	—	Do.	8,000	4 00	....	....	
	MAUCH CHUNK	Pa.	50,000	50	—	Do.	7,000	4 00	....	....	
1857	MARIETTA	O.	50,000	50	—	Do.	7,000	4 00	....	....	
1860	MARION	O.	12,000	25	5	April & October.	1,500	3 55	....	....	Stock firm.
1858	MARYSVILLE	Cal.	50,000	100	—	January & July.	4,000	12 50	....	....	
1857	MASSILON	O.	20,000	25	—	Do.	5,000	3 00	....	....	
1855	MEADVILLE	Pa.	39,500	25	—	Do.	4,000	3 50	....	....	
	MEDINA	N. Y.	2,000	100	—	Do.	2,000	7 00	....	....	
1852	MEMPHIS	Tenn.	300,000	100	5	June & December.	12,000	3 50	....	....	
	MERIDEN	Ct.	20,000			Do.			....	....	
1859	METROPOLITAN (N. Y. City)	N. Y.	1,000,000	100	—	January & July.	200,000	2 50	....	....	
1859	MIDDLEBORO'	Mass.	15,000	—	—	Private Works.		6 00	....	....	
1858	MIDDLETOWN	Ct.	50,000	25	3	March & September.	5,000	3 80	....	....	
	MIDDLETOWN	N. Y.		25	—	Private Works.	3,000	3 00	....	....	Owned by G. T. Sutton.
	MILFORD	Mass.	20,000	—	—	Do.		4 00	....	....	
	MILLEDGEVILLE	Ga.	100,000	50	—	Do.		5 00	....	....	
	MILTON	Pa.	10,000			Do.			....	....	
1847	MILWAUKEE	Wis.	400,000	50	5	January & July.	24,000	3 50	150	....	
1852	MOBILE	Ala.	200,000	—	—	Do.	30,000	4 50	....	....	
1836	MONROE	Mich.	40,000	50	—	Do.	5,000	3 50	50	....	
1852	MONTGOMERY	Ala.	100,000	25	4	February & August.	7,000	6 00	....	....	
1856	MONTPELIER	Vt.	30,000	25	3	January & July.	5,000	4 50	....	....	
1859	MORRISANIA	N. Y.	30,000	50	—	Do.		4 00	....	....	
1859	MORRISTOWN	N. J.	13,000	50	—	Do.	3,500	4 00	....	....	
1854	MOUNT HOLLY	N. J.	16,650	25	3	April & October.	2,000	7 00	....	....	
	MOUNT VERNON	O.	50,000	100	—	Do.		4 00	....	....	
1857	MUSCATINE	Iowa.	50,000	100	—	January & July.	3,000	4 50	...	....	
1854	NANTUCKET	Mass.	50,000	100	3	February & August.	6,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1852	NASHUA	N. H.	45,000	50	3½	January & July.	10,000	3 50	....	....	
1850	NASHVILLE	Tenn.	200,000	50	5	Do.	25,000	3 50	....	....	
1858	NATCHEZ	Miss.	46,000	50	—	Do.	20,000	5 00	....	....	
1853	NEW ALBANY	Ind.	200,000	50	3½	Do.	16,000	3 50	....	....	
1846	NEWARK	N. J.	362,000	50	5	Do.	45,000	3 62	130	....	Always a favorite stock.
1856	NEWARK	O.	30,000	100	—	Do.	7,000	5 40	....	....	
1852	NEW BEDFORD	Mass.	130 000	100	5	Do.	15,000	2 90	102	....	Well managed and kept quiet.
1859	NEWBERN	N. C.	22,000	100	6	Do.	6,000	3 50	....	....	
	NEW BRITAIN	Ct.	30,000	20	5	Do.	3,000	4 00	....	....	
1851	NEW BRUNSWICK	N. J.	100,000	20	4	Do.	8,000	3 00	115	....	
1852	NEWBURG	N. Y.	67,000	20	4	Do.	10,000	4 00	105	....	
1852	NEWBURYPORT	Mass.	150,000	10	4	Do.	9,000	4 00	92½	....	
1857	NEWCASTLE	Del.	82,300	10	3	Do.	4,000	4 00	90	....	
1847	NEW HAVEN	Ct.	250,000	25	4	Do.	30,000	3 00	155	....	None in market.
1853	NEW LONDON	Ct.	70,000	50	3	Do.	12,000	4 00	105	....	Do.
1835	NEW ORLEANS	La.	1,500,000	100	6	Do.	120,000	4 00	180	....	
1858	NEWPORT	R. I.	130,200	100	4	Do.	10.000	3 50	112	....	
1854	NEWTON & WATERTOWN	Mass.	300,000	100	2	Do.	10,000	4 00	....	....	
	NEWTON	N. J.	30,000	—	—	Do.	3,000	4 00	....	....	
	NEWTON	Pa.	20,000	50	—	Do.	2,000	4 00	....	....	
1823	NEWTOWN	N. Y.									
1859	NEW YORK	N. Y.	1,000,000	50	5	May & November.	100,000	2 50	300	....	
	NIAGARA FALLS	N. Y.	15,000	25	—	Do.	3,000	4 00	90	....	
	NORFOLK	Va.	60,000	25	—	Do.	40,000	4 00	....	....	
1853	NORRISTOWN	Pa.	41,700	25	4	June & December.	8,000	3 50	....	....	
1855	NORTH ATTLEBORO'	Mass.	50,000	100	3½	Do.	6,000	4 00	....	....	
	NORTHERN LIBERTIES	Pa.	400,000	25	7	City Works.	40,000	2 50	....	....	
	NORTH ADAMS	Mass.	25,000	—	—	March & September.	30,000	4 00	....	..	
1856	NORTHAMPTON	Mass.	85,000	25	3	January & July.	4 500	4 00	....	....	
1859	NORTH BRIDGEWATER	Mass.	16,000	100	4	June & December.	1,000	7 00	....	....	
1856	NORWALK	Ct.	30,000	150	4	February & August.	6,000	4 00	....	....	
1859	NORWALK	O.	30,000	25	—	January & July.	4,000	4 00	....	....	
1854	NORWICH	Ct.	75,000	25	3½	Do.	12,000	3 50	....	....	
1861	NORWICH	N. Y.	12,000	50	—	Do.	2,500	4 00	....	..	
1859	NYACK	N. Y.	20,000	100	—	Do.	2,500	4 00	....	....	
1860	OBERLIN	O.	10,000	—	—	Do.	1,200	4 00	....	...	
1855	OGDENSBURG	N. Y.	75,000	50	5	Do.	9,000	4 00	....	.. .	
1859	ORANGE	N. J.	65,000	25	—	Do.	6,000	3 50	....	....	
1852	OSWEGO	N. Y.	81,250	100	3½	Do.	15,000	4 00	105	....	Good works, built by Hoy, Jr., & Kennedy.
1855	OTTAWA	Ill.	45,000	100	6½	Do.	6,000	4 00	....	....	
1856	OWEGO	N. Y.	40,000	50	3½	Do.	5,000	4 00	....	....	
1860	OWENSBORO'	Ky.	25,000	25	—	Do.	4,000	3 50	....	....	
1856	PADUCAH	Ky.	75,000	100	—	May & November.	4,000	5 00	....	....	
1861	PAINESVILLE	O.	40,000	25	5	Do.	2,500	5 00	....	.. .	
1856	PALMYRA	N. Y.	12,000	25	—	January & July.	3,000	7 00	....	....	
1847	PATERSON	N. J.	125,000	25	3	Do.	20,000	3 50	95	....	
1850	PAWTUCKET	R. I.	75,000	50	4	Do.	12 000	3 00	....	....	
1855	PEEKSKILL	N. Y.	31,000	50	3	June & December.	4,000	4 00	....	....	Surplus $10,000, May 15, 1863.
1860	PENN YAN	N. Y.	12,000	50	5	Do.	3,000	4 00	....	....	Works leased to Gilbert T. Sutton.
1859	PEOPLES', CHICAGO	Ill.	500,000	50	New	Do.	100,000	2 50	....	....	
1855	PEORIA	Ill.	100,000	50	4	Do.	8,000	3 50	....	....	What is this Company doing?
1852	PETERSBURG	Va.	120,000	—	5	January & July.	20,000	3 80	....	....	
1841	PHILADELPHIA	Pa.	3,000,000	50	—	City Works.	650,000	2 00	....	....	
1855	PIQUA	O.	50,000	50	—	January & July.	6,500	4 00	....	....	
1835	PITTSBURG	Pa.	300,000	100	5	Do.	60,000	1 50	115	....	
1854	PITTSFIELD	Mass.	50,000	100	5	Do.	4,500	4 00	....	....	
1858	PLACERVILLE	Cal.	30,000	50	—	Do.	4,500	10 00	....	....	
1860	PLAINFIELD	N. J.	25,000	50	—	Do.	2,500	4 00	....	....	
1859	PLATTSBURG	N. Y.	16,000	50	—	January & July.	5,000	7 00	....	....	
1853	PLYMOUTH	Mass.	40,000	100	—	April & October.	8,000	4 00	....	....	
1860	PORT CHESTER	N. Y.	50,000	50	—	Do.	4,000	4 00	....	....	
1860	PORT JERVIS	N. Y.	20,000	100	—	Do.	3,000	4 10	....	....	
1849	PORTLAND	Me.	300,000	50	4	January & July.	30,000	3 00	....	....	
1859	PORTLAND	Oreg.	50,000	50	—	Do.	3,500	8 00	....	....	
1859	PORT LAVACCA	Texas.	50,000	100	—	Do.	2,500	7 00	....	....	
1851	PORTSMOUTH	N. H.	70,000	100	8	April & October.	6,500	3 70	....	....	
1855	PORTSMOUTH	O.	50,000	50	4	January & July.	10,000	3 50	....	....	
1855	PORTSMOUTH	Va.	100,000	50	4	Do.	4,000	4 00	....	....	
1856	POTTSTOWN	Pa.	20,000	50	3	Do.	3,500	4 00	....	....	
1850	POTTSVILLE	Pa.	110,000	50	2	Do.	10,000	3 50	....	....	
1850	POUGHKEEPSIE	N. Y.	84,000	25	4	March & September.	15,000	3 50	120	110	
1848	PROVIDENCE	R. I.	1,000,000	50	4	January & July.	60,000	3 00	122	....	
1853	QUINCY	Ill.	300,000	50	4	June & December.	12,000	3 50	....	....	
	QUINCY	Mass.	60,000	00	—	Do.	00,0 0	0 00	....	....	
1855	RACINE	Wis.	43,500	26	—	Do.	7,000	3 50	....	....	
1857	RARWAY	N. J.	50,000	20	—	January & July.	5,000	4 00	....	....	
1858	RALEIGH	N. C.	25,000	100	6	May & Novrmber.	5,000	6 00	....	....	
1848	READING	Pa.	100,000	25	4	January & July.	25,000	3 00	....	....	
1851	RICHMOND	Va.	341.975	—	—	City Works.	30,000	3 00	....	....	
1859	RICHMOND	Mass.	40,000	25	—	January & July.	3,000	4 00	....	....	Jeff. Davis has extinguished the gas-lights of Richmond, Va.
	RICHMOND COUNTY	N. Y.									
1859	RIPLEY	O.	30,000	50	—	Do.	2,000	4 50	....	....	
1852	ROCHESTER	N. Y.	200,000	50	5	Do.	50,000	2 50	....	....	
1857	ROCKFORD	Ill.	40,000	50	—	Do.	4,000	4 00	....	....	
1854	ROCK ISLAND	Ill.	100,000	50	—	Do.	6,000	4 50	....	....	
1854	ROCKLAND	Me.	50,000	100	—	Do.	6,000	4 40	....	.. .	
1852	ROME	N. Y.	35,000	100	3½	Do.	10,000	3 60	....	....	
1854	RONDOUT and KINGSTON	N. Y.	65,150	20	3½	June & December.	10,000	3 80	....	....	
1854	ROXBURY	Mass.	150,000	100	5	January & July.	20,000	3 50	....	....	
1859	RUTLAND	Vt.	20,000	25	—	Do.	4,000	3 50	....	....	
	SACO	Me.	71,600	100	3½	April & October.	8,000	4 00	....	....	
1857	SACRAMENTO	Cal.	500,000	100	—	Do.	40,000	10 00	....	....	
1859	SAG HARBOR	N. Y.	20,000	—	—	Do.	4,000	4 00	....	....	
1858	SAINT ALBANS	Vt.	15,000	20	—	Do.	3,000	7 00	....	....	
	SAINT JOHNSBURY	Vt.	30,000	25	—	Do.	4,000	4 00	....	....	
1857	SAINT JOSEPH	Mo.	50,000	100	5	January & July.	6,000	5 00	....	....	
1859	SAINT LOUIS	Mo.	600,000	50	—	June & December.	180,000	3 50	....	....	
1857	SAINT PAUL	Min.	200,000	50	3	January & July.	10,000	6 00	....	....	Surplus $10,000, May 15, 1863.
1856	SALEM	N. J.	30,000	25	3	Do.	5,000	3 86	....	....	
1850	SALEM	Mass.	200,000	100	4	February & August.	30,000	3 24	....	....	
1859	SALEM	O.	25,000	20	—	Do.	3,000	3 00	....	....	
1859	SALISBURY	N. C.	14,600	50	6	May & November.	3,500	6 00	....	....	
	SALISBURY MILLS	Mass.	1,250	25	—	Do.	3,000	4 00	....	....	
	SALMON FALLS	Me.	25,000	100	—	Do.	3,000	4 00	....	....	
	SAN ANTONIO	Texas.	75,000	20	—	Do.	40,000	6 00	....	....	
	SAN DIEGO	Cal.	30,000	50	—	Do.	50 000	10 00	....	....	
1854	SANDUSKY	O.	75,000	50	—	April & October.	9,000	3 00	....	....	
1859	SANDWICH	Mass.	10,000	—	—	Private Works.	2,000	3 50	....	....	
1852	SAN FRANCISCO	Cal.	1,000,000	100	6	Do.	50,000	8 00	110	....	
1853	SARATOGA SPRINGS	N. Y.	39,000	100	—	January & July.	6,000	3 60	70	....	
	SAUGERTIES	N. Y.	30,000	20	—	Do.	4,000	3 00	....	....	
1849	SAVANNAH	Ga.	200,000	25	5	Do.	10,000	3 75	....	....	
1851	SCHENECTADY	N. Y.	50,000	—	—	Private Works.	11,000	4 00	....	....	
1858	SCRANTON, Gas and Water	Pa.	100,000	25	—	January & July.	6,000	3 80	....	....	About trying Water-Gas.
1857	SELMA	Ala.	20,000	100	—	Do.	2,000	5 00	....	....	
1856	SENECA FALLS AND WATERLOO	N. Y.	80,000	50	3	Do.	10,000	4 00	100	....	
	SHREVEPORT	La.	40,000	25	—	Do.	3,000	0 50	....	....	
1856	SING SING	N. Y.	40,000	100	—	Do.	3,000	4 00	....	....	
	SMYRNA	Del.						4 00	....	....	Petroleum Gas.
1860	SOUTH ADAMS	Mass.	10,000	25	—	Do.	3,000	4 00	....	....	
1859	SOUTH BRIDGE	Mass.	5,000	25	—	Do.	4,010	6 00	....	....	
	SOUTH BOSTON	Mass.	200,000	50	—	Do.	60,000	3 25	110	....	
	SPRINGFIELD	O.	200,000	100	—	Do	20,000	3 50	....	....	
1854	SPRINGFIELD	Ill.	75,000	50	—	January & July.	10,000	3 50	....	....	
1848	SPRINGFIELD	Mass.	100,000	500	5	February & August.	10,000	3 60	140	....	
1855	STAMFORD	Ct.	6.250	25	5	April & October.	3,000	3 50	....	....	
1857	STATEN ISLAND	N. Y.	150,000	50	5	January & July.	26,000	4 00	95	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY, No. 39 NASSAU STREET, NEW YORK, DEALER IN GAS-LIGHT SHARES.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1859	Staunton	Va.	18,000	50	6	January & July.	4,000	7 00	....	....	
	Steubenville	O.	150,000	100	—	Do.	15,000	4 00	....	....	
	Stockton	Cal.	50,000	—	—	Do.	8,000	10 00		....	
1848	Syracuse	N. Y.	125,000	25	5	March & September.	25,000	3 00	112	....	
	Tamaqua	Pa.	40,000	25	—	Do.	3,000	4 00	....	....	
1859	Tarrytown and Irvington	N. Y.	70,000	50	—	January & July.	3,000	4 00	....	....	
1853	Taunton	Mass.	100,000	50	4	Do.	10,000	4 00	....	....	
	Terre Haute	Ind.	100,000	100	—	Do.	3,000	4 00	....	....	
	Thompsonville	Ct.	25,000	50	—	Do.	4,000	4 50	....	....	
	Tiffin	O.	25,000	20	—	Do.	4,000	4 00	....	....	
1853	Toledo	O.	100,000	50	3	Do.	8,000	3 50	....	....	
1847	Trenton	N. J.	100,000	20	4	Do.	15,000	3 42	....	110	
1848	Troy	N. Y.	200,000	100	4	June & December.	35,000	3 60	160	....	
1856	Urbana	O.	30,000	25	—	April & October.	3,500	4 00	....	....	
1849	Utica	N. Y.	80,000	100	4	Do.	22,000	3 60	....	....	
1853	Vicksburg	Miss.	65,000	50	—	March & September.	4,000	4 50	....	....	
1859	Vincennes	Ind.	25,000	100	—	January & July.	2,000	4 00	....	....	
1858	Walden	N. Y.	2,500	—	—	Private Works.	1,000	6 00	....	....	
1853	Waltham	Mass.	100,000	100	4	January & July.	3,000	4 00	....	....	
1857	Ware	Mass.	30,000	20	—	Do.	3,500	4 00	....	....	
1861	Warren	O.	30,000	50	—	Do.	4,000	3 00	....	....	
1854	Warren	R. I.	20,000	25	—	Do.	3,000	4 00	....	....	
1855	Washington	D. C.	500,000	20	5	Do.	50,000	3 25	150	148	
1859	Washington	N. C.	15,000	100	—	April & October.	1,500	6 00	....	...	
1848	Washington	Pa.	20,000	25	4	January & July.	4,000	3 00	....	....	
1854	Waterbury	Ct.	100,000	25	—	Do.	4,000	4 00	....	....	
1852	Waterford	N. Y.	12,000	25	—	Do.	4,000	4 00	....	....	
1852	Watertown	N. Y.	20,000	100	—	Do.	10,000	7 00	....	....	
1856	Watertown	Wis.	25,000	100	—	Do.	5,000	5 00	....	....	
1858	Wautoma	Wis.	30,000	50	—	Do.	3,000	4 50	....	....	
1857	Waverly	Miss.	20,000	100	—	April & October.	4,000	5 00	....	....	
1854	West Cambridge	Mass.	60,000	100	—	February & August.	10 000	4 00	....	....	
1852	Westchester	Pa.	100,000	25	2½	Do.	3,500	3 50	....	....	
	Westfield	Mass.	25,000	100	6	Do.	4,000	4 00	....	....	
	Weston	O.	20,000	25	—	Do.		5 00	....	....	
1857	West Point	N. Y.	50,000	—	—	United States Military	Academy.	2 00	....	....	
1853	West Troy	N. Y.	100,000	50	3	January & July.	10,000	3 60	85	....	
1850	Wheeling	Va.	75,000	25	6	Do.	12,000	2 70	....	....	
	White Plains	N. Y.	20,000	20	—	Do.			....	....	
1856	Wilkesbarre	Pa.	50,000	50	—	May & November.	4,000	3 33	100	80	
1850	Williamsburg	N. Y.	1,000,000	50	5	January & July.	60,000	3 00	....	....	
1858	Williamsburg	Va.	30,000	25	—	Do.	3,000	4 00	....	....	Camp-fires of the Union Army light up this place at present.
1857	Williamsport	Pa.	70,000	25	4	Do.	3,500	3 80	....	....	
1859	Willimantic	Ct.	12,000	—	—	Do.	2,500	3 50	....	....	
1853	Wilmington	N. C.	60,000	50	5	Do.	8,000	5 00	....	....	
1852	Wilmington	Del.	200,000	50	5	February & August.	20,000	3 00	....	....	
1854	Winchester	Va.	36,000	50	6	January & July.	5,000	4 00	....	....	
	Windsor	Vt.									
	Woburn	Mass.	20,000	—	—	Do.	3,000	4 00	....	....	
1856	Woodstock	Vt.	10,000	50	4	Do.	4,000	6 00	....	....	
1853	Woonsocket	R. I.	82,500	100	4	April & October.	4,000	3 50	....	....	
1856	Wooster	O.	25,000	50	—	January & July.	6 000	3 00	....	....	
1849	Worcester	Mass.	160,000	100	5	Do.	15,000	3 50	....	....	
1855	Xenia	O.	40,000	50	—	Do.	3,000	4 00	....	....	
1854	Yonkers	N. Y.	75,000	50	2½	Do.	6,500	4 00	102½	....	
1849	York	Pa.	40,000	57	3	June & December.	10,000	3 50	....	....	
	Yorkville	S. C.	20,000	25	—	Do.	4,000	4 00	....	....	
1858	Ypsilanti	Mich.	20,000	50	5	February & August	6.000	14 00	....	....	
1850	Yreka	Cal.	30,000	100	—	Do.	2,000	0 00	....	....	
1848	Zanesville	O.	44,600	25	4	Do.	10,000	3 50	....	....	

GAS-LIGHT COMPANIES IN THE BRITISH PROVINCES OF NORTH AMERICA.

When Chartered.	Town.	Province	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1854	Belleville	C. W.	33,040	100	4	January & July.	1,200	5 00	....	....	
1854	Brantford	C. W.	32,000	100	2½	Do.			....	....	
	Brockville	C. W.	50,000	—	—	Do.	5,000	4 00	....	....	
	Chatham	N. B.	50,000	—	—				....	....	
1854	Charlotte Town	P. E. I.	50,000	100	5	Do.	3,000	3 50	....	....	
1857	Cobourg	C. W.	30,000	—		February & August.	4,000		....	....	
	Dundas	C. W.	30,000	—	—	Do.	6,000	4 00	....	....	
	Frederick	N. B.	50,000	—	—	Do.			....	....	
1843	Halifax	N. S.	160,000	40	7	May.	30,000	3 00	....	....	
1850	Hamilton	C. W.	125,000	40	5	March & September.	20,000	3 50	....	....	
1848	Kingston	C. W.	80,000	100	—	Do.	6,000	3 50	....	....	
1853	London	C. W.	100,000	20	5	May & November.	5,000	5 00	....	....	
1847	Montreal	C. E.	400,000	40	—	March & September.	110,000	2 80	....	113	Last sale at this figure.
1854	Ottawa	C. W.	40,000	40	5	Do.	5,000	4 50	....	....	
1859	Point Levi	C. E.	25,000	25	—	January & July.	4,000	3 50	....	....	
1859	Port Hope	C. W.	28,000	20	4	May & November.	4,500	3 50	....	....	
1847	Quebec	C. E.	200,000	200	4	January & July.	60,000	3 00	....	....	
1848	Saint Catherine's	C. W.	80,000	20	—	May & November.	7,000	4 50	....	....	
1859	Saint Hyacinthe	C. E.	15 000	20	—	Do.	4,000	4 00	....	....	
	Saint John	N. B.	170,000	85	—	June & December.	25,000	3 50	110	110	Sales at this figure.
	Saint John's	N. F.	50,000	—	4	Do.	30,000		....	....	
1858	Sorel	C. E.	14,000	20	4	Do.	4,000	3 00	....	....	
1848	Toronto	C. W.	400,000	100	4	February & August.	50,000	3 23½	....	....	

GAS-LIGHT COMPANIES IN CUBA, MEXICO, SOUTH AMERICA AND NEW ZEALAND.

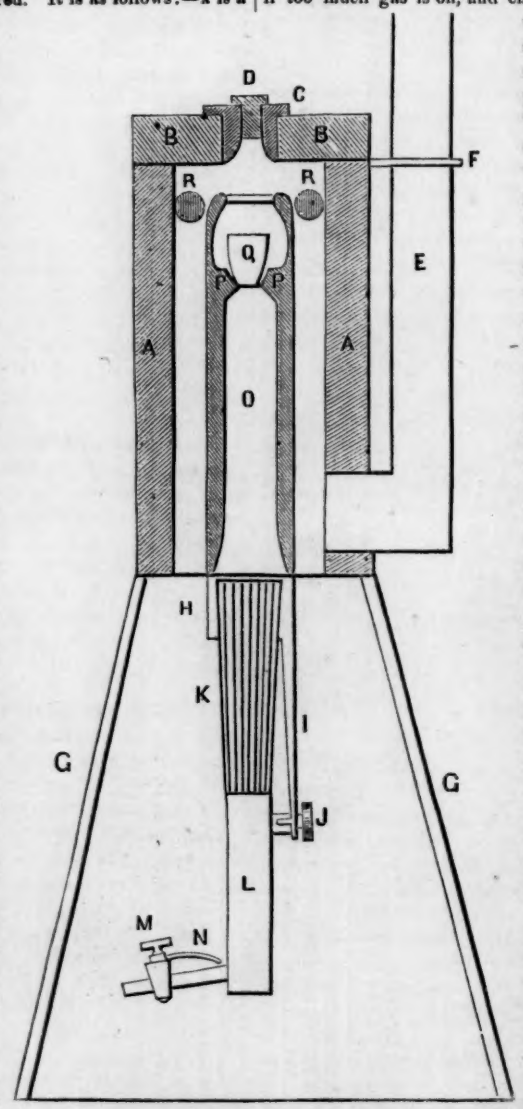
When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
	Callao	Chile.		—	—	January & July.	20,000	7 00	....	....	
	Cardenas	Cuba.	50,000	—	—	Do.	180,000	5 00	....	....	
1857	Compania Cubana	Hav'a.	500,000	500	10	Do.			....	....	
	Cienfugos	Cuba.		—	—	Do.	12,000	5 00	....	....	These four towns are lighted by the Compania Cubana of Havana.
	Guanabacoa	Cuba.		—	—	Do.	14,000	5 50	....	....	
	Regla	Cuba.		—	—	Do.	10,000	5 00	....	....	
	Trinidad	Cuba.		—	—	Do.	16,000	5 00	....	....	
	Guyaquil	S. A.	150,000	—	—	Do.	35,000		....	....	
	Havana	Cuba.	1,250,000	500	7½	Do.	300,000	5 00	....	....	
	Lima	Peru.	100,000	—	—	Do.	150,000		....	....	
	Maranham (Chartered)			—	—	Do.			....	....	
	Matanzas	Cuba.	50,000	—	—	Do.	180,000	8 50	....	....	
	Mexico City	Mex.	550,000	—	—	Do.			....	....	
	Montevideo	S. A.	500,000	—	—	Do.			....	....	
	Para (Chartered)			—	—	Do.			....	....	
1854	Rio de Janeiro	S. A.	1,000,000	500	7½	Do.	300,000	4 00	....	....	
	San Iago	Chile.	500,000	—	—	Do.	180,000	7 00	....	....	
1857	Saint Jago de Cuba	Cuba.	450,000	500	—	Do.	25,000	5 00	....	....	
	Valparaiso	Chile.	500,000	—	—	Do.	85,000	6 00	....	....	
	Vera Cruz	Mex	500,000	—	—	Do.			....	....	
	Vi le Clara	Cuba.	50,000	—	—	Do			....	....	
	Auckland	N. Z.		—	—	Do.			....	....	

ON A NEW PATENT GAS FURNACE FOR EXPERIMENTAL, ANALYTICAL, AND OTHER PURPOSES.

BY GEORGE GORE, ESQ.

Being recently engaged in an investigation upon the electro-chemical relations of bodies in fused substances, I required a furnace by means of which I might fuse cast iron, &c., and have the melted substances perfectly accessible to be manipulated upon for a continuous and lengthened period of time without contact with impurities or with the atmosphere, and without lowering their temperature sufficient to cause them to solidify. I wished also to obtain these conditions by means of ordinary coal-gas and atmospheric air, without the use of a bellows or lofty chimney, or of regenerators or valves requiring frequent attention.

After making numerous and expensive experiments, I found an arrangement possessing almost completely all the qualifications desired. It is as follows:—A is a cylinder of fire-clay about nine inches high and six inches diameter, open at both ends, with a hole in its side near the bottom to lead into the chimney; it is covered by a movable plate of fire-clay, B, with a hole in its centre for introduction or removal of the crucible, &c.; this hole is closed by a perforated plug of clay, C, for access to the contents of the crucible, and that again is closed by another clay stopper, D. E is a chimney of sheet iron about five or six feet high, kept upright by a ring of iron, F, attached to the top of the furnace.



The fire-clay cylinder is enclosed in a sheet-iron casing with a bottom of iron, to which are fixed three iron legs, G. An iron tube, H, with a prolongation, I, supports, by means of the screw, J, the burner, K, and its tube, L, which is open at both ends. Gas is supplied to the burner by means of the tap, M, which has a small index, N, attached to it for assistance in adjusting the gas. Inside the larger cylinder is another fire-clay cylinder or cupola, O, with open ends, and with three projections of fire-clay, P, for supporting the crucible, Q; it is kept steady by means of three fire-clay marbles, R. The gas-burner is a thin metal cylinder, deeply corrugated at its upper end, with the corrugations diminishing to nothing at its lower end.

The action of this furnace is as follows:—Gas is admitted to the open tube, L, by the tap, M; it there mixes with air to form a nearly explosive mixture, which ascends through the burner, and burns in the clay cylinder, O, being supplied with the remainder of air necessary to complete combustion through the tube, H, to the outer surface of the flame by means of the spaces between the corrugations. The flame and products of combustion pass up through the cylinder, O, and then downwards outside it to the chimney, the focus of greatest heat being at Q.

It is important in using this furnace that the burner is placed quite in the centre of the bottom of the tube, O; also that a crucible of not too large nor too small dimensions be selected. The most suitable way of supporting a smaller crucible is by placing it in a larger one that has had its upper parts broken off. If desirable, a little clay luting may be placed round the top edge of the iron casing to exclude air entering between it and the cylinder; also a little thin clay luting upon the part of the bottom of the furnace where the inner cylinder, O, rests.

In lighting the furnace, the plugs, C and D, are removed, a light held *inside* the opening, and the gas turned on full. Should the flame blow down to the bottom of the tube, L, on lighting (which, however, rarely occurs unless the furnace is already hot), the gas must be turned off, and the bottom of L momentarily closed whilst lighting the gas as before. Should the flame not burn down to the burner, but only burn at the orifice in the clay plate, B, it must at once be extinguished and re-lighted, otherwise some of the gaseous mixture will pass into the chimney unburned, and subsequently ignite and cause an explosion. A large flame now issues from the top orifice, and is white if too much gas is on, and chiefly violet or red with the proper quantity; it should now be coarsely adjusted until these appearances are presented. The annular plug, C, should now be inserted, which will compel it to pass downwards to the chimney, and as soon as the small remaining flame now issuing disappears, or nearly disappears, as it will in a few seconds, the small stopper, D, should also be inserted. In lieu of this, the large flame may be deflected against the chimney by means of a piece of sheet iron until it withdraws inwards as before mentioned; the two plugs may then be re-inserted. The gas tap may now be partly adjusted. The crucible should be placed in the furnace after the act of lighting the gas, but not immediately after if the furnace is cold, or explosions may occur by unburned gaseous mixture passing the crucible into the chimney and igniting afterwards.

After about five minutes, the gas should be slowly adjusted, until a sound is heard inside like a series of small explosions. This sound is sometimes not very distinct, especially at high temperatures, and therefore requires a little experience in the use of the furnace in order to be detected. It is, however, a chief guide in determining the proper amount of gas, and should therefore be carefully studied. To assist in adjusting the gas, it will be found very useful to place a small piece of looking-glass beneath the tube, L, and to adjust the gas tap until the flame between the burner and crucible appears wholly violet or slightly white; but this test is liable to fallacy if employed when the gas is just lighted, because the coldness of the parts makes the flame much whiter than it otherwise would be. It is also fallacious, the flame appearing whiter than it really is when the crucible is very hot. It is, however, of great assistance, especially at intermediate temperatures. A rough deposit upon the outer edge of the crucible indicates an excess of gas; the deposit is carbon. Less gas is required with a crucible in the furnace than without one; also less is required when the small hole at the top of the furnace is open than when it is closed; and less is also required when the furnace is cold than after it has been lighted some time, because the draught gradually increases and draws in more air. After having accurately adjusted the gas, no further attention to the furnace is requisite.

Having once found the proper adjustment of gas under certain known conditions, it is well to notice the position of the index pointer, N, in order to be able at once to adjust it to about the right point on other occasions. Under ordinary circumstances, during daylight I have found it best to set the gas nearly fully on at first, and fully on about five minutes afterwards, when the draft has become more powerful; but during twilight, when the supply of gas from the gas-works is more free, I have set the index pointer at the numbers 2½ or 3. The gas should be supplied by a pipe of not less than three-eighths of an inch bore, with a main pipe of half an inch; but all depends upon the pressure of gas at the particular locality, which is very variable. The consumption of gas varies from 30 to 40 cubic feet per hour, the value of which is about twopence.

The top of the chimney should be placed in a position where the products of combustion can pass freely away. If it is placed in an opening or pipe leading to another chimney, care must be taken not to have the draught too powerful, otherwise the heat will be drawn more into the chimney, and the supply of gas in the daytime may be found rather deficient. The furnace will act satisfactorily, though less powerfully, with the chimney standing in an open room without any special outlet for the products of combustion, provided the full height (6 feet, of chimney is employed. Under other circumstances, I have generally used a chimney 4½ or 5 feet high.

This furnace will produce what is generally called "a white heat" it will readily melt half a pound of copper or six ounces of cast iron. I have melted these quantities in it; it will melt as large a quantity of those substances as the largest sized crucible that can be introduced into it will contain, sufficient space being reserved around the crucible for draught. It requires from twenty to thirty minutes to acquire its highest temperature, and then *the entrance part of the chimney exhibits a faint red heat in daylight.* If it exhibits much more than this, the draught is too powerful, and, if less, there is not sufficient gas.

With one ounce of copper put into the cold furnace, and the gas lighted and properly adjusted, the copper generally begins to melt at about the tenth or twelfth minute, and is completely melted by the fifteenth. With the heat well up, one ounce of copper has been melted in it in two and a quarter minutes, one ounce of cast iron in three minutes, five ounces of copper in four and a quarter minutes, and three ounces of cast iron in five minutes. With the smaller hole in the top of the furnace open, one ounce of copper has been melted in three and a half minutes, and several ounces of copper have been kept in fusion upwards of half an hour, and may be kept so for any length of time; cast iron has also been fused, and kept melted under the same conditions. These various effects have also been obtained in a somewhat diminished degree with the chimney standing in an open room.

When the small hole, D, is open, some air is drawn in that way, and less air passes up with the gas through the tube, O, but the cold air does not much diminish the temperature of the crucible, because it combines with the excess of gas now passing over the edge of the inner cylinder; it, however, renders the flame round the crucible white by deficiency of air, and this should be partly corrected by lessening the gas. An excess of either gas or air renders the surface of melted copper dull.

When it is desirable to perfectly avoid contact of air with the fused substance during manipulation, a narrow crucible should be employed, and a thin and narrow ring of fire-clay should be placed upon the top of the tube, O, to contract its opening; the flame then closes completely over the top of the crucible, and prevents access of air; a proper adjustment of gas, together with exclusion of air in this manner, enables a perfectly bright surface of melted copper, or even tin, to be continuously maintained, from which the images of parts above are clearly reflected. The clay ring may be withdrawn by lifting the plate, B. A less perfect exclusion of air may be obtained by employing a narrow crucible placed rather low down in its support. A small iron dish should be placed beneath the tube, L,

to receive any melted substance that may fall. The furnace is protected by letters patent, and may be obtained of the licensed manufacturer, E. W. Ball, 11 Islington, Birmingham. The chief conditions of success in the use of this furnace are *sufficient gas, a suitable degree of draught,* and *proper regulation of gas to air.—Chemical News.*

REPORT OF MR. HAYWOOD AND DR. LETHEBY ON THE CONSUMPTION OF GAS AT THE PUBLIC LAMPS IN THE CITY OF LONDON.

To the Honorable the Committee upon General Purposes of the Commissioners of Sewers of the City of London.

Sewers Office, Guildhall, May 29th, 1863.

Gentlemen,—The matters recently referred to us in relation to the public lighting of the City of London are as follows:

First.—The complaints of defective lighting made by certain inhabitants of the city.

Secondly.—The Report of the Great Central Gas Company to the effect that they found the average consumption of gas at the public lamps within their district to be *more* than the contract quantity instead of *less,* as reported by your engineer.

Thirdly.—The suggestion from the company that their agents should be allowed to be present, whenever further experiments as to the quantity of gas consumed at the public lights were made by the officers of the commissioners.

Fourthly.—The statement of the same company that the carburetting process caused the lanterns to be so blackened by smoke as to render it impossible to keep them clean without employing double the present number of workmen for the purpose.

First. *As to Defective Lighting.* We have to remark that the complaints referred to us are solely from one district, namely, the vicinity of Sise Lane, Pancras Lane, Well Court, and George Yard. In those localities the gas is carburetted in precisely the same manner as it is in the other districts of the city where there have been no complaints of defective lighting. We have therefore caused a circumstantial inquiry to be made into the condition of the public lights in those localities; and we have likewise ourselves conducted a personal examination of the matter. The results are, that although in one or two instances there was undoubtedly a small deficiency in the quantity of gas supplied to the lamps, yet, on the whole, the amount of light in that district was quite equal to the average of any part of the city. In fact, it appears, from the letter of the Great Central Gas Consumers Company to the Commission, in January last, that, at the very time the complaints were being made by the inhabitants of Well Court, the lamps of that locality were being supplied by the gas company with 5.4 cubic feet of gas per hour. If this be true, there must not only have been the full amount of gas required by the inhabitants, but there must also have been the additional effect of the carburation, which should have been equal to 3 cubic feet per hour, making together a light equal to 8 cubic feet of gas from each lamp of the court. It is manifestly impossible to reconcile these discrepancies, or to determine the real ground of complaint.

With regard to the second point of reference—viz., *the Report of the Great Central Company to the effect that their officers had found a much larger supply of gas to the public lamps than we had*—we have only to remark that our observations were made with great care, and with instruments that had undergone the most searching tests to ensure their accuracy, and we believe that our results were in every particular correct.

It is very probable, however, that, as a month elapsed between the time of our experiments and those of the company, a very different condition of things exised; for, independently of the circumstance that the burners may have been opened in the process of cleaning, or many have been changed altogether, there was a manifest improvement in the quantity of light in all parts of the city directly after the publication of our report. Without, therefore, entering into any explanation of the probable cause of the difference in our results, we may safely say that no reliance can be place on the comparative value of tests made at an interval of a month. In illustation of this, we may refer to the results of our own more recent testings of the light at the lamps on the 12th of February last, when we continued, or rather repeated, the observations which we made in 1862.

The results of these observations are as follows:

	February, 1863. Strength of Light.	
	Without Meters. Yards.	With Meters. Yards.
At lamps with carburators (3 cubic feet per hour being the contract supply).	6.53	6.75
At lamps without carburators (5 cubic feet per hour being the contract supply)	5.65	6.25

These results show that, in February, 1863, the difference in the amount of light from the carburators which had meters and those which had not, was only about 6 per cent., whereas, in October, 1862, it amounted to 58 per cent.; and, in the case of the lamps without carburators, the difference between those with meters and those without, was, in 1863, but 22 per cent.; whereas, in 1862, it was 55 per cent. That is, in October, 1862, the lamps with meters gave, in each case, about 58 per cent. more light than those without; whereas, in February, 1863, the difference was only from 6 to 22 per cent.

We also ascertained that the lamps with carburators and *with* meters, consuming nominally 3 cubic feet of gas per hour, gave a better light than the lamps *without* meters, burning nominally 5 cubic feet per hour; and that the lamps *with* carburators gave more light than those *without* carburators (when compared under similar conditions, in respect of meters), instead of giving less light, as in 1862.

These observations were fifty six in number, and were made, like the former, between the hours of 8.30 P. M. and midnight.

The differences between the light given at the two periods—viz., 1862 and 1863 —will be best seen by the subjoined table:

	Strength of Light. October, 1862. Yards.	February, 1863. Yards.	Per Centage of Increase, February, 1863.
Lamps with carburators.			
With meters	5.512	6.75	50.03
Without meters	4.378	6.53	128.24
Mean	4.945	6.64	86.65
Lamps without carburators.			
With meters	5.925	6.25	11.46
Without meters	4.758	5.65	41.48
	5.341	5.95	26.47

Thus, the light from the public lamps has been largely increased, in all parts of the city, and under all conditions.

And it is important to notice, that the light at the lamps where the gas was carburetted, was very much stronger (nearly 25 per cent. stronger) than that at the other lamps where the gas was not carburetted, although, in the first case, only 3 feet of gas per hour is consumed, and, in the second, 5 cubic feet of gas per hour is the contract quantity.

It should be here stated, that, upon the 1st of February, the Commission, by its own agents, undertook, and has since applied, the carburating process, and, therefore, it is probable that much of the increase in luminosity in the district of the Great Central Gas Company, is due to the care with which that process is now carried out; but we nevertheless have no doubt that a better supply of gas has been everywhere given by all the companies; in fact, the increase of light in the district supplied by the chartered company, can only be ascribed to an increased consumption of gas.

Thirdly. *As regards the request of the company that their agents should be present at the time when your officers are making their examinations,* we are of opinion that however desirable it is to have their assistance in the inquiry, there are almost insuperable objections to it; for, in the first place, it would be necessary to give the company some hours notice of your intention to make experiments, and this, undoubtedly, would give uncertainty to the results, if, indeed, it did not altogether frustrate the object of the inquiry; and, in the next place, it would be almost impossible to make a sufficient number of experiments in the course of a night, if every experiment had to be repeated again and again for the satisfaction of those who were looking on.

There is but one way, indeed, in which the difficulty may be met, and that is, by testing the burners at given pressures. This, however, would hardly secure reliable results, for, at the lamp, the consumption of the burner is dependent not only on the pressure in the main, but also on the extent to which the tap is turned, and on the condition of the burner. If, therefore, this process were followed, it must be with a stipulation that the pressure at the burner is uniform, and that the tap is always turned full on.

Fourthly. *With respect to the complaint by the company that the carburetting process had caused the deposit of soot upon the lanterns, and had obscured the light, and had given rise to increased labor in keeping the lanterns clean,* we are satisfied that this only occurred at the time when a new and better quality of naphtha was first supplied to the carburators. With the old naphtha it had been found necessary in some cases to increase the light by using a cap upon the burner. This had the effect of checking the supply of air to the flame, and, therefore, of hindering the oxidation of the carbon in the naphtha, and so of increasing the amount of light; but, when the new naphtha was used, it was so rich in carbon that the caps prevented the proper degree of oxidation, and the carbon escaped in an unburnt condition, and was deposited upon the glass of the lanterns. Nothing, however, was easier than the remedy for this; for when the caps were removed, and care was taken that the burners were sound, and of proper discharging capacity, the flame was brilliant and free from smoke.

We believe, however, that the matter has been somewhat exaggerated, for while the gas company asserts that about a hundred lanterns were blackened in this manner in a single night, the inspectors report there were not above twenty in such a condition in all the city; and, as there are 1727 lanterns in the district supplied by the company, at which the gas is carburetted, it is manifest that the proportion of blackened lanterns was very small. Besides which, we are of opinion that the specimen produced by the company was a very extreme example of the mischief complained of, and was calculated to give the Commission a very erroneous idea of the nature of the complaint.

It seemed to us that the question which had been thus raised by the company, deserved further investigation. Instructions were, therefore, given to the inspectors of pavements, to report regularly on the cleansing of the street-lamps. From that time to the present, they have informed us whenever the lanterns were cleaned; and the result of this systematic supervision is, that the lamps are in a much more cleanly state than we have ever before observed.

Having thus reported on all the points referred to us, we beg leave to remark, that the great labor bestowed upon this subject by the Commission, and the searching inquiries, and experimental investigations, which they have caused to be made, have resulted in a far more satisfactory condition of the public lighting of this city, and, perhaps, of the whole metropolis, than has been witnessed for many years past. As a matter of economy, and also of satisfaction to the public, one thing is yet wanted, and that is the means of securing and maintaining with the utmost certainty the proper supply of gas to the public lamps; this can only be done by the use of a meter, and by the commissioners taking the entire charge of the public lighting.

We have the honor to remain, Gentlemen, your most obedient servants,

WILLIAM HAYWOOD,
Engineer.
HENRY LETHEBY,
Medical Officer of Health and
Chemical Examiner of Gas.

GAS IN YORK CATHEDRAL.—The nave of York Cathedral was lighted a few weeks since, for the first time, with gas. In the nave there are 740 gas-lights, which, with 400 additional burning in the chancel, produce a grand and imposing effect, both within and without the building. The lighting is considered a great success.

WATER-WORKS FOR BUENOS AYRES.—The municipality of the city of Buenos Ayres, South America, have officially invited English engineers to send in plans for the better supply of that city with water, and have offered a premium of £400 for the best plan.

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is the recognized official organ of

LIGHT, HEAT, WATER-SUPPLY AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

TERMS—CASH IN ADVANCE.

SUBSCRIPTION—In the U. S. and British Provinces, $3 per annum. In Great Britain, 12s. per annum, payable in British post-office orders, remitted to the Editor, as below.

ADVERTISEMENTS—According to position and space occupied.

☞ Remittances by mail to be addressed to the Editor,

C ELTON BUCK,

ROOMS of the AMERICAN GAS-LIGHT JOURNAL,
No. 39 Nassau st., cor. of Liberty st., opposite the Post-Office.
New York City.

AGENTS OF THE AMERICAN GAS-LIGHT JOURNAL

FOREIGN.

Germany .....B. WESTERMAN & Co., of New York.
Great Britain....TRUBNER & Co., 60 Paternoster Row, London, where single copies may always be found,
Paris, France...LE JOURNAL DE L'ECLAIRAGE AU GAZ, 25 Boulevard Poissonnière.

DOMESTIC.

V. HAROLD MYERS, No. 152 South Fourth st., Philadelphia.
The AMERICAN GAS-LIGHT JOURNAL can be purchased of all the newspaper and periodical dealers in the U. States and Canadas.

THE
AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

C. ELTON BUCK, ... EDITOR.

TUESDAY, SEPTEMBER 1, 1863.

In our last number we reverted to the fact that many of the country gas companies in the province of Canada were almost on the brink of ruin, and that this deplorable situation was owing to the low price of kerosene oil, consequent upon the abundant yield of the Canada oil wells. The information which we had received directly from the gas companies themselves, was sent to us some time prior to the publication of the article, before the great reaction in prices which is now being felt by oil dealers both in Canada and the United States. We have recently received information that the oil wells are now exhibiting a very singular state of uncertainty, that the supply has materially diminished, and that some wells have entirely failed.

Although we have not received any well authenticated information that the greater number of the oil wells have, or are about to entirely fail, yet we perceive from the tenor of the remarks of some of our contemporaries, that a crisis is being experienced in the Canada oil trade; and that events are transpiring which may be of the utmost importance to gas companies in that country. It is certain that oil even at the wells is very scarce, and it is equally certain that this scarcity has not been produced by any sudden or unexpected demand. This being the case, the only other cause which can be assigned for the lack of supply, is a partial failure of the flow of oil. The following paragraph from the Oil Springs *Chronicle* is significant:

The present high price of crude oil at the wells has had the effect of recalling quite a large amount from Quebec which was shipped there last season. The Liverpool Oil Co. of Sarnia have bought what there was in the Quebec market, and the same, some 2,400 barrels, we understand, is now *en route* from the latter to the former place, where it will be manufactured in the Company's extensive new works. The distance from Quebec to Sarnia is 700 miles in round numbers. This, we should say, is an extreme instance of "carrying coals to Newcastle."

An earlier number of the *Chronicle* comments in a more serious tone upon the dark prospects of the great business which is the chief staff and support of the town of Oil Springs. The first indications of disaster to the oil interest, were noticed in February last, when a number of flowing wells ceased running. At that time the price of crude petroleum at the wells was but 50 cents per barrel. Since then it has gradually advanced, until it is now quoted at $5 50 and even $6 per barrel at Oil Springs. The advance in the price of the refined oil has, of course, been proportionally high. The daily yield at this place is now but 150 barrels from all sources.

In the oil region of Pennsylvania prices have advanced in a rapid ratio, and the last quotations there were $5 to $6 per barrel. Refined oil has advanced in similar proportion.

In view of these facts, the prospects of the gas companies we mentioned in our last issue may have a chance for revival. The prospects of the Canada oil region seem to be bad indeed, but while the oil interests suffer, the gas light interests are proportionally enhanced. These suffering companies may be yet resuscitated, and we hope they may find brighter days before them than they had been led to expect.

The rapid fluctuations in the value of petroleum which have occurred again and again, form a very conclusive array of arguments against the assertions of those philosophers who predicted that it must supersede coal everywhere as a raw material for making gas. The supply is not adequate to the present demand, and if the cessation of the Canada wells be permanent, the main attention of buyers will be directed to the Pennsylvania wells, and in that event we shall see still greater advances, and more rapid fluctuations than have yet been witnessed.

EXHAUSTERS.

We have frequently expressed surprise that so many of our gas-companies neglect to avail themselves of the advantages resulting from the use of exhausters. It is astonishing that in the face of the many examples where the employment of these machines has been attended with the most gratifying results, there are yet many gas-companies who still go on in the old way, and who put up with inconveniences and even positive loss, because they do not take the proper steps for the introduction of improved apparatus, which the experience of more liberal companies has proved to be almost absolutely necessary.

We have recently cherished the hope that a growing interest in the subject of exhausters is being felt by gas-engineers. During the past year a number of companies have essayed their use for the first time. In every instance where we have taken the trouble to inquire as to the experience of the working of these machines, the reply has been most satisfactory, and surprise was expressed that their necessity had not been demonstrated earlier. In small as well as large works, their efficiency has been proved, and the increase in the quantity, and the superiority of the quality of gas produced from either clay or iron retorts will be attested by every engineer using them.

The peculiar sensitiveness of officers of gas-companies in reference to publishing any figures showing the daily operation of their works, is well understood by the profession. Were it not for this habitual reticence (which we must attribute to modesty alone), we might lay before our readers some interesting details concerning the advantages which more than one gas-company have received from the introduction of the exhauster. Suffice it to say, that the first cost of the machine, and the power required to run it, are trifles when compared with the increased production of gas, and the regularity and uniformity of the whole operation of the works

The rotary exhauster, known as MACKENZIE'S patent, manufactured by Messrs. SMITH & SAYRE of this city, is the instrument to which we have referred in the foregoing remarks. Although we are not in the habit of referring to private enterprises in our editorial notes, we deem this subject one of paramount importance, and desire to draw the attention of our friends to it; knowing that by so doing, we are suggesting to them a matter of much moment, and one which we would gladly see them appreciate. The number of gas-companies in this country not using exhausters, is entirely too large, and we earnestly desire to see an improvement in this respect, knowing that both shareholders and consumers would alike reap the benefits.

FAIR OF THE AMERICAN INSTITUTE.

The fair of the American Institute will open on Thursday next, the 3d instant, at the Academy of Music, in this city, and will remain open until the 23d. The Board of Managers are making extensive arrangements for the exhibition, which promises to be one of unusual interest. The horticultural exhibition will be opened on the 16th instant, at the same place, and will continue open one week.

For several days workmen have been employed in preparing the Academy for the reception of articles for exhibition, which commenced to-day. Extensive alterations have been made in the interior of the building, including the removal of the scenery and other portable material from the stage, which, with the flooring covering the seats in the parquet, affords an extensive area for the main exhibition. The large saloons in the second floor and the adjacent apartments will be appropriated for the Fine Arts, Photographic Exhibitions, &c.

The Board of Managers have secured the services of the opera band, which will be present during the exhibition.

The fair, like those heretofore held under the auspices of the Institute, will be restricted to American productions; it will be general in its character, embracing manufactures of all kinds, new inventions, improvements in agricultural implements, and the mechanic arts generally, but the machinery will not be propelled by steam-power. Competent judges will be appointed, on whose decisions the premiums will be awarded; the Institute, however, will insist on a high standard of excellence, or very decided improvement in all articles competing for premiums.

The managers find it impossible, as yet, to determine the disposition of space, owing to the heavy demand made upon them, but as articles arrive the character and size of each will decide the most suitable position to be occupied.

Among the articles entered on the books of the Institute for competition in the coming exhibition are the following:

In the Agricultural Department—a combined head seed-drill and cultivator; a large assortment of India rubber goods, of which material a numerous class of new and useful articles are now made; a type-setting machine, in operation, will be apportioned a prominent place; improved sewing-machines of an entirely new pattern and system; new surgical implements, patent, artificial limbs, &c., which the war has rendered a prominent feature of study and trade; a new indestructible burial case and an indicating ventilator for coffins; a patent protective police club.

Aside from these, the following trades, professions, &c., will be duly represented:

Naval architecture, millinery, philosophical and mathematical instruments, silver-plated ware, stationery, musical instruments, billiard tables, household articles, boats, boots and shoes, cabinet ware, drugs, electrotyping, confectionery, &c., &c.

From the foregoing it will be seen that the exhibition will be one worthy of the attention of every citizen. We hope the makers of gas-apparatus will be fully represented by their contributions to the fair, and that their display will be creditable to them. We will make a note of any important inventions we may see at the exhibition, and hope that in the department of light, water supply, and sewerage, we may find many valuable inventions displayed.

PRESERVATIVE PROPERTIES OF COAL-TAR.—M. Rottier has placed a paper before the Royal Academy of Belgium, upon the preservation of wood by the heavy oil of coal-tar, in which he states that, after reviewing the number of compounds this complex product contains, the volatile hydro-carbons, aniline, phenic acid, and naphthaline, do not possess any preservative properties; but that a green oil, which is produced in the distillation of coal-tar at a temperature of about 572° Fahrenheit, is the substance alone that resists the decay of wood.

FINANCIAL.

Monday Evening, August 31st, 1863.

The dullness in gas shares still continues, and we have no new sales to report nor quotations to make. We presume this quiet state of things will continue throughout the month of September, after which we shall look for greater activity, although, for reasons which we have mentioned before, we can never expect to see gas stocks share in the irregular ebb and flow which characterizes the general share list.

We have been informed from official sources, that the *Bangor*, Maine, Gas-Light Company have reduced the price of their gas from $3 50 to $3 00 per thousand cubic feet. This reduction was induced in consequence of the competition of kerosene oil, and under the circumstances, the act of the company in reducing the price may be regarded as a very wise one, and will undoubtedly redound to their profit, although it may cause some temporary excitement among the nervous shareholders of the company. We think other companies suffering from the same cause might adopt a like policy, and thus retrieve their losses. Reductions in price, have ever been followed by increased gains to the company making them. We have given many proofs of this in examples of English companies, and the more liberal minded gas-engineers of that country are convinced that gradual and reasonable concessions in price, instead of impoverishing a company, rather swell their coffers, and produce increased prosperity. The semi-annual dividends of the Bangor gas-company are now 2½ per cent. nett—the State tax and the United States Excise tax being borne by the company. We confidently look for increased dividends, resulting from increased consumption, arising from the liberality of the directors in making the handsome concession we have announced.

We observe an inquiry for *New York* and *Metropolitan*, N. Y.. shares—particularly the latter, which has not yet reached the high point of inflation to which the other can lay claim. Holders of these stocks are unwilling to part with them, however, and the market is entirely bare of them.

A few parcels of *Manhattan*, N. Y., are offered at private sale, but at prices which are above the views of purchasers.

ANSWERS TO CORRESPONDENTS.

A. B. L., of N. Y.—*Of course, a gas-burner adds materially to the temperature of a room. The assertion that a gas-stove will heat flat-irons and do the cooking of a family, without elevating the temperature of the apartment, is a misrepresentation, and we should strongly doubt the veracity of the party making it.*

J. P. C., of Conn.—*Your letter was received during our absence from the city, which accounts for the delay in acceding to your request. Your second letter has just been received. We will have to send for the pamphlet, which we will cheerfully place at your disposal.*

E. A. F., of Pa.—*Accept our thanks for your exertions. The package arrived safely, and the contents have been properly placed. The work you need will have to be imported, as we have not been able to obtain a copy in this city.*

J. McD., of Md.—*The works have temporarily suspended operations, but they are expected to resume them at an early day. Some minor disputes will have to be reconciled in the meantime.*

J. P. T., of Ind.—*The question has been often agitated, especially in England. Our back numbers contain the most important papers which have been published on either side. Dr. Letheby contended that free sulphuric acid is generated from the sulphur in coal-gas, while Lewis Thompson, Esq., asserted, with equal confidence and perhaps greater argumentative skill, that the ammonia in gas neutralizes the acid, producing sulphate of ammonia. We incline to Mr. Thompson's view of the case, for London gas almost invariably contains an excess of ammonia—more than enough to saturate the sulphuric acid generated from the combustion of the sulphur.*

O. M., of Ohio.—*We think the town you mention plenty large enough for gas-works—that is, provided the people have spirit enough to support them. Smaller towns have been successfully lighted with gas in this country, while in England, villages of but half the size have works in successful operation.*

J. E. K., of Mich.—*We have not the particulars of the case before us, nor do we know where they can be obtained. We will accede to your request if possible.*

G. E. S., of Ill.—*Yes. The parties are now in business in this city, and will, doubtless, be glad to hear from you.*

Demas, of Cal.—*We advise you not to touch it. To us it presents a very shaky and insecure appearance, and should be avoided. The stock has been watered at a fearful rate, and can never pay upon the capital. There are other enterprises which will pay you much better than that.*

J. S. D., of N. Y.—*We advise you to apply directly to the officers of the company, and openly state your grievances. Failing in receiving any redress by this course, you can resort to more stringent measures.*

O. A. G., of Pa.—*We cannot tell you where you will be suited as that depends upon several circumstances. The parties you name are all well known, and have honorable reputations. Any of them would be of some service to you.*

GAS PURIFIED BY CARBURATION.

In February last a report was made to the Mayor of Nimes, France, by two professors of the Imperial College in that town, on Mr. Nordhoff's process of carburating gas. Benzole was the liquor used for carburation. The specimen employed in the experiments of the professors boiled at 167° to 170° Fahrenheit, and at a temperature of 50°, had a specific gravity of .88. In their report the professors say:

"Having carburated a stream of gas during three consecutive days, it was impossible to find the most feeble trace of sulphuric acid or its compounds in the gas so heated. It would neither discolor the ordinary lead paper, nor a solution of acetate of lead, through which the gas was made to pass. The ordinary gas, on the contrary, was at the same time highly charged with the sulphur compounds, the solution being blackened instantly, and the lead paper also instantly discolored. This remarkable fact is one of the prime advantages of carburation. We need no longer fear any injury to gilded or plated surfaces, provided the gas be carburated."

The professors also directed their essays to ascertain the economy of carburated gas. From their experiments "it appears that the illuminating power of carburated gas, like that of ordinary gas, was not proportionate to the quantity of gas consumed. Hence in carburation it is advantageous to use small burners, since two burners of 1.77 foot each give 2.2 carcel, whilst the burner of 3.96 feet gives only a light of 1.5 carcel."

The proportion of carburated gas necessary to give a light equal to common gas is in favor of the former fully 50 per cent. The professors say:

"The standard carcel light of 1.1 requires 5 feet of common gas per hour, or 1,000 feet will be equal to the standard carcel burning 200 hours.

"Now, the same light will be given by 360 to 600 cubic feet of carburated gas, say by 500 feet, or a little more than the mean of these two. Hence the comparative cost will be as follows:

1,000 feet of common gas,.....	$1 54
WHEN CARBURATED,	
500 feet of common gas,.....	77
¾lb. benzole,.....	14
Cost per 1,000 cubic feet,.....	91

So that the saving amounts to 63 cents, equivalent to 41 per cent.

These figures have been more than verified by practice. At the cafe in Nimes, near the Mayor's residence, the consumption during the month of January, 1862, before carburation, was 4,061 cubic feet, while in the corresponding month of 1863 the consumption of carburated gas by the same burners was only 2,190 cubic feet. This shows a saving of gas equal to 48 per cent.

Water-Works of Liverpool, England.—The water-works of Liverpool, England, are extensive. The gathering ground of the water extends over about ten thousand acres, the water from which is retained in several reservoirs. These reservoirs, when full, are calculated to contain three billion gallons. The water is passed through filter beds, six in number. From the filter beds the water passes into the pure-water tanks, and thence by cast-iron pipes.

Gas in Italy.—The new gas-works in the city of Naples, are being erected under the supervision of M. Colladon, of Geneva. They comprise four retort houses, 113 feet long by 62 feet wide, and two buildings of the same length, by 46 feet wide. Each retort house is to contain eight double beds of seven clay retorts, giving a total of 448 mouth-pieces and 64 furnaces. At one extremity of the retort-houses a chimney is to be erected for the service of the retorts contained in it, and a condenser at the other extremity. The latter is composed of a rectangular box, 23 feet long, by 3 feet 4 inches wide and 5 feet deep, upon which are fixed 28 pipes, of 11 inches internal diameter, and four small boxes, 5 feet long by 1 foot 8 inches wide, and 2 feet deep, with internal divisions, the object of which is to cool the gas on its exit from the hydraulic main, before it reaches the large box of the condenser. In one of the parallel buildings are erected two oscillating washers, two exhausters, and a steam-engine. Two purifying-houses are also erected, each of which is to contain eight purifiers. Six tanks, of 77 feet 3 inches in diameter, with gas-holders of 75 feet 3 inches diameter, and 26 feet 3 inches deep, and coal and coke stores, workshops, stables, dwelling-house, with about 82 miles of mains, complete this important establishment.

Gas Explosion in Scotland.—On Friday evening, July 24, an explosion of gas took place in the cellar of Messrs. Littlejohns', at Glasgow. A pipe leading from the main in the street broke, and the gas escaped into the cellar. Word was sent to the gas company's office, and a workman was sent to the place. While he was examining the pipe in the cellar with a lighted candle, the gas, which filled the apartment, exploded, destroying the ceiling and breaking the glass in the front door of the house. The workman escaped injury.

Nitro-Benzole from Coal-Gas.—John Leigh, of Manchester, England, has taken out a patent for preparing nitro-benzole from coal-gas. Cannel gas is submitted to the action of nitric acid as follows:

"Into a series of earthenware vessels, in the form and arranged in the manner of Woulfe's bottles, is introduced a quantity of fuming nitric acid, and through this is passed a current of gas, the operation being continued so long as any action is exerted by the acid upon the gas." When the operation is completed, nitro-benzole is found condensed in the bottles; which may be separated with a faucet, and employed for the manufacture of aniline colors. The gas thus treated, however, is liable to carry over some acid in the pipe. To prevent this, it is passed through an alkaline solution or moist lime, to neutralize the acid.

Gas in Spain.—The concession for lighting the town of Cadiz with gas has been renewed for eighteen years. The price has been fixed at 90 cents per thousand cubic feet for the public lights, and $1 40 per thousand for the private consumer. The *Bulletin de l'Industrie* says that these conditions are considered to be very onerous; for, in addition to the price of coal being very high, and the sale of coke very difficult and uncertain, the works are in so deplorable a state that new ones have to be erected, and the mains are too small and in bad condition.

Gas in Scotland.—The annual meeting of the directors of the Glasgow Gas-Light Company was recently held in that city. It was stated that the directors were enabled to recommend dividends of 10 per cent. and 7½ per cent. upon stocks entitled to those rates respectively, and they had a balance over of nearly £2,500. Part of this balance had been carried to the reserve fund, which now amounted to £29,104 13s. 5d., being the total sum authorized by Act of Parliament, and £106 7s. 10d. was carried forward to the credit of next year's revenue account. Notwithstanding the very depressed state of trade during the past year, the quantity of gas made had considerably exceeded the quantity consumed during the previous year, showing that the extension of the town was making up for the short consumption arising from a number of public works being comparatively idle during a great part of the year.

ON THE CONSTANTS OF GAS ENGINEERING.

(From the Sanitary Reporter)

We propose to examine, under this title, some of the preliminary conditions which belong to the establishment of new gas-works, and to investigate some of the relations which exist between population, supply, and capital necessary for establishing and carrying on gas-works.

All large engineering works, such as railways, sewerage works, gas and water-works, have certain constants expressing the relation between cost and some definite unit. Thus we speak of railways costing so much per mile, and of the other kinds of work costing so much per head of population. This expression, however, is very vague and indefinite as applied to gas-works, because it is impossible to fix any absolute and definite ratio between the amount of population on the one hand and the supply of gas on the other. Great mistakes are frequently made in confounding the population of a town or borough with that of a much larger district, which is in reality supplied by a gas company. Again, the supply per head of population is very grealy affected in some towns by the existence of large manufacturing establishments, which consume great quantities of gas, although the consumption in dwelling-houses may be comparatively small. In fact, any estimates of the cost of gas-works per head of population are entirely fallacious, unless we take into account the population of the whole district actually supplied.

Take for example the case of Birmingham, which is supplied by two companies, having an aggregate paid-up capital of £569,600. Now, a hasty inquirer would be very much misled if he imagined, for a moment, that this large capital was employed in supplying the town or borough of Birmingham, having a population of 296,076, according to the census of 1861. He will find, on investigation, that whilst one of the companies is confined to the supply solely of the borough, the other company has power, in addition, to supply a large surrounding district, comprising the large and populous places of Bilston, Wednesbury, West Bromwich, Walsall, Aston, and many others. He will find, in fact, that the population of this large outlying district exceeds that of Birmingham itself, and that, in fact, the aggregate population which the two companies have power to supply, instead of being under 300,000, consists, in point of fact, of about 641,258 persons. The borough of Walsall, however, with a population of 40,000, is also supplied by the corporation of Walsall, so that, perhaps, this should be excluded from the area of the two Birmingham companies, leaving in round numbers a population of about 600,000.

A much more satisfactory constant by which to express the capital of a gas company is the quantity of gas annually manufactured, or the tonnage of coal annually converted into gas. Thus it conveys much more definite and satisfactory information to say that gas-works will cost so much per million feet of gas annually manufactured, or so much per ton of coal annually converted into gas, than to say they will cost so much per head of population, unless the district within which the population is contained be at the same time especially understood and defined.

The following particulars relate to the companies supplying the metropolis, in which the area supplied is quite distinct and definite, and the population within the limits assigned to the companies can be ascertained with considerable accuracy.

The aggregate capital now employed by the thirteen companies supplying within the limits of the metropolis, as defined by the Metropolis Management Act and by the Metropolis Gas Act, 1860, is £5,602,900, of which £4,455,581 consists of share capital, and the remaining £1,147,319 is borrowed.

The population of the metropolis within the district of the Metropolitan Board of Works, that is, as defined by the Act for the Local Management of the Metropolis, appears, from the census of 1861, to be 2,809,004. From this should be deducted upwards of 95,000 persons living in Hammersmith, Woolwich, Plumstead, and other districts not supplied by companies comprising the above aggregate capital. When this deduction is made we have in round numbers a population of 2,714,000 supplied by a group of companies having an aggregate capital of £5,602,900, or more than £2 per head of population.

As this aggregate capital is, however, excessive and exaggerated, it will be fairer to take a capital in the same proportion as that of the more economical companies, namely, a capital at the rate of £5 per ton of coal actually carbonized in the course of the year. It has been shown that such a capital for the whole metropolis would amount to £4,405,000, or about 32*s.* 6*d.* per head of population. The advocates of more sweeping reforms, however, would go beyond this, and contend that the London companies are not entitled, as against their consumers, to pay a dividend on a larger capital than £427 for each 100 tons of coal, this being the rate at which the Independent actually works.

ON THE PROPORTION BETWEEN THE NUMBER OF RETORTS AND THE PRODUCTIVE CAPACITY OF GAS-WORKS.

A single retort from 7½ to 9 feet long, will carbonize with six-hour charges from 6 to 9 cwt. of coal a day; and when worked with shorter charges will, of course, do more than this. According to the usual system of six-hour charges, however, as prevailing in works where common coal is used, as distinguished from cannel coal, the capacity of a single retort may be reckoned at from 6 to 9 cwt., according to its length and area.

Hence the quantity of coal which a retort would carbonize, if worked every day of the year, would be $\frac{365 \times 6}{20} = 122\frac{1}{2}$ tons, taking its capacity to be 6 cwt per day, and 184 tons or 50 per cent. more, taking its capacity to be 9 cwt. per day.

Nothing of this kind, however, is now attained in actual practice, because it is found that many of the retorts which are absolutely necessary to supply the demands for gas, in the winter, are not required at all in the summer, and hence it is usual to calculate the annual production of gas at not more than 150 or 200 times that of the shortest day.

Put t = annual tonnage of coal, then, according to the preceding explanations, the number of retorts may vary from—

$$\frac{20t}{200 \times 9} = \frac{t}{90} \text{ up to } \frac{20t}{150 \times 6} = \frac{t}{45}$$

In one of these cases it is, of course, assumed that each single retort will carbonize 90 tons a year, and in the other only 45 Probably both of these are extreme cases, but the following examples will show that in many large works the retorts do quite as much, or nearly as much, work as that indicated by the first of these equations. The following examples show the proportion of tonnage of coal and number of retorts in some large works:

	Tons Carbonized per Annum.	No. of Single Retorts.	Tons per Retort.
The Chartered Gas-Works, Westminster Station	58,000	652	89
Sheffield	31,000	358	87
Huddersfield	11,000	144	76
Preston	13,500	223	61
Norwich	8,000	223	36

In the two latter cases the number of retorts is evidently unnecessarily great, and, as a general rule, wherever the number of retorts is more than one for every 75 tons of coal carbonized, the productive capacity is probably in excess of that which will be required for several years to come.

Taking the average production of twelve-candle gas from the ordinary gas-making coal of this country, it may be assumed that 107 tons of coal will make a million cubic feet of gas, this being at the rate of 9,346 feet of gas from each ton of coal. Hence, the capital per million feet of gas actually made will be 107 times the capital per ton of coal.

It has been laid down by an eminent engineer largely connected with gas-works, and capable of taking comprehensive views on the subject, that, as a fair test of the capital employed in gas-works, it may be assumed that £300 is a proper amount to be represented by each retort. Here, of course, is to be understood short single retorts, such as have been described, and not the large description, eighteen or twenty feet in length, and which are charged at each end.

The following table, extracted from Hughes' "Analysis of the London Gas Companies'" accounts, shows this proportion for each of the thirteen companies supplying the metropolis, and included in the Metropolis Gas Act of 1860:

PROPORTION BETWEEN CAPITAL AND TONNAGE OF COAL.

Name of Company.	Capital.	Tons of Coal Carbonized per annum.	Ratio of Capital to Tonnage of Coal.
Chartered	£719,460	147,695	487
City of London	407,805	57,032	715
Commercial	350,589	64,962	509
Equitable	280,400	35,609	788
Great Central	238,160	88,450	619
Imperial	1,579,755	243,585	649
Independent	186,782	43,695	427
London	651 692	75,240	866
Phœnix	495,000	71,971	688
Ratcliff	99,097	19,885	500
South Metropolitan	163,525	30,695	533
Surrey Consumers'	184 794	27 970	661
Aggregate	£5,837 109	856,759	623
Western	265,791	25 732	1,033
Aggregate	£5,602,900	882,491	635

This table shows that while the Independent Company has a capital equal to £427 for each 100 tons of coal, the London Company, which is the highest of those using principally common coal, has a capital of £866, or more than double the amount for each 100 tons of coal carbonized in the year. The Western Company, which makes exclusively cannel gas, has the largest comparative capital of any.

The companies printed in italics are those whose capital exceeds the average.

It is evident from a comparison of this table with the condition of other large companies throughout the kingdom, that great extravagances have been committed by the London companies, and that their average rate of more than £6 per ton of coal is by no means a fair rate to assume for the cost of gas-works throughout this country. The excessive capital of these companies may be traced to many causes, such as the execution of the works in years during which high prices prevailed, to excessive and extraordinary provision made for increase and extension of works, and in some cases, perhaps, to gross mismanagement or something worse, on the part of those intrusted with the execution. It is remarkable that the oldest of all, the venerable Chartered Company—which now claims an existence of more than half a century—stands out in favorable contrast with most of its younger brethren. It may be that many grievous errors have been committed by this pioneer of progress, and many costly and useless experiments have had to be atoned for by the experiences of late years, yet notwithstanding all this, during the whole 50 years of its existence, this company figures for a smaller comparative amount of capital than any of the others, with the single exception of the Independent. A more particular examination of the preceding table enables us to see that five of the companies employ an aggregate capital of only £490, or say, in round numbers, £500 for each 100 tons of coal, or at the rate of £5 per ton of coal. These five companies are the Chartered, the Commercial, the Independent, the Ratcliff, and the South Metropolitan.

The following are some examples of works, showing the proportions which prevail:

The Westminster station of the Chartered Gas-works carbonized, in 1856, about 58,000 tons of coal, which produced 554,000,000 feet of gas. This was effected in 326 double or 652 single retorts, and the structural value of the works was then about £237,000, although the capital appearing in the accounts of the company as representing their works amounted to £334,000. Hence the capital amounts to £5 14*s.* per ton of coal, and to £512 per retort, and each retort carbonized nearly 89 tons of coal per annum.

The Sheffield Works, a year or two ago, had a capital of £237,000, and made 285,000 000 feet of gas in 358 retorts, with a tonnage of coal equal to 31,000.

Here the capital is nearly £8 to a ton of coal, and each retort carbonized nearly 87 tons of coal.

The Huddersfield Works, with a capital of £67,000, made annually 100 million feet of gas in 144 single retorts, with 11,000 tons of coal. Here the capital is more than £6 per ton of coal, and each retort only carbonizes 76 tons of coal, so that the capital amounts to £465 per retort.

The two large companies now supplying Birmingham and the adjacent district are the Old Birmingham Gas-Light and Coke Company, and the Birmingham and Staffordshire Gas Company. The former, which only supplies within the borough of Birmingham, has, up to this time, raised a capital of £211,700, and, according to its revenue, should carbonize annually about

42,500 tons of coal, so that, on this supposition, the capital would be about £5 per ton of coal. An examination of the accounts, however, seems to show that the loss by leakage is something enormous, so that, in all probability, considerably more coal is required to make the gas which is annually sold. On this supposition the capital would be considerably less than £5 per ton of coal.

The other company, which for brevity may be distinguished as the Staffordshire Company, supplies, as well as the borough, a large and populous district lying outside, and the capital raised by this company to the present time is about £358,000. This company, according to its receipts for gas, appears to carbonize annually about 73,000 tons of coal, so that here again the capital is about £5 per ton of coal. This company appears also to lose very considerably by leakage, although probably not to so great an extent as the older company.

The accounts of this company, however, seem to justify the supposition that about 90,000 tons of coal are annually carbonized, in which case the capital will be under £4 per ton of coal.

Lastly, among the great companies, take the case of Bristol. The capital of the Bristol United Gas-Light Company, which supplies Bristol, Clifton, and some adjacent villages, appears at the present time to be about £240,000. Now, in the last accounts deposited by this company with the Clerk of the Peace, the expenditure for coal seems to be £20,556, which will produce 54,816 tons, at 7*s.* 6*d.*, the price which the company returned as the cost of coal in a document which was printed by the London gas companies, and produced before Parliament in the Metropolitan gas inquiry. This amount of coal would represent a capital of £5 4*s.* per ton of coal. Even supposing the coal for making twelve-candle gas to cost 10*s.* per ton, the tonnage would be 41,112 tons, which would represent £5 17*s.* of capital per ton of coal; possibly the truth may be somewhere between these two extremes.

When we examine the particulars of new companies, we find the existence of some more speculative elements.

For instance, the Parliamentary estimate of the Great Central Company, calculated to produce annually 368,000,000 cubic feet from 40,000 tons of coal was something under £165,000, or a little more than £4 per ton of coal. This capital also included mains of sufficient capacity to distribute double the quantity of gas, so that, in point of fact, the estimate for works capable of carbonizing 80,000 tons of coal was only 250,000, or a little more than £3 per ton of coal.

Truth compels us to acknowledge, however, that these estimates have not been verified, because in the year 1860 we find the Great Central with a capital of £238,160, and at the same time carbonizing only 38,450 tons a year, so that the capital is at the rate of about £6 4*s.* per ton of coal. The Great Central, however, is by no means an example of a company with an economical rate of capital. In fact, its capital is very high in comparison with the five London companies which have been lately enumerated.

In the Marylebone Gas Bill, which was brought before Parliament in 1859, the proposed capital was £200,000, the number of retorts 320, and the coal to be carbonized per annum, only 26,050 tons; thus each retort was to carbonize 81 tons a year, while the capital was £625 per retort, and more than £7 per ton of coal. It should be observed, however, that as the works were to be situated between eight and nine miles from London the capital included a sum of nearly £50,000 for mains to convey the gas into the district in which the consumption was to take place.

In the case of the Newcastle Gas-Consumers' Bill, which has been recently before Parliament, and has already passed the House of Commons, the works proposed are identical as to capacity with Mr. Croll's in the Great Central, having a capacity of producing or manufacturing 368,000,000 feet of gas a year, and supplying about 320,000,000 feet. The estimate for the works, including £10,000 for meters, is £148,000, which is considerably lower than Mr. Croll's in the Great Central case, and amounts to little more than £400 per million cubic feet of gas. The estimate, however, does not include the extra mains comprised in Mr. Croll's estimate for conveying double the supply of gas; and it should also be borne in mind that every description of building and artificers' work is cheaper at Newcastle than in London.

TABLE SHOWING THE RELATIONS BETWEEN CAPITAL, PRODUCTION OF GAS, AND TONNAGE OF COAL.

Capital per Ton of Coal.	Capital per Million Ft.	Capital per Retort. Allowing 45 Tons a year for each Retort.	Allowing 60 Tons a year for each Retort.	Allowing 75 Tons a year for each Retort.	Allowing 90 Tons a year for each Retort.
£	£	£	£	£	£
3	321	135	180	225	270
4	428	180	240	300	360
5	535	225	300	375	450
6	642	270	360	450	540
7	749	315	420	525	630
8	856	360	480	600	720

As to the dividends which Gas Companies are entitled to pay to their shareholders:

The Gas-Works Clauses Act limits the dividend to 10 per cent. on a *bona fide* share capital, and most of the special acts for incorporating new gas companies provide, that when half of the prescribed share capital has been paid up, and the whole subscribed for, one-third of the whole amount may be borrowed. Thus, suppose a share capital divisible into six equal parts, when three of these parts have been paid up, two more parts may be borrowed, and as money on good security can be borrowed at 4 to 5 per cent., it is evident the public will be in the best position when the gas company exercises its borrowing powers under the conditions above supposed.

Thus, when half the share capital shall have been paid up, the company will be in a position to borrow £200 for every £300 of share capital so paid up. Hence, every £500 of aggregate capital may be composed as follows:

£300 entitled to dividend at 10 per cent.	£30
£200 borrowed at 5 per cent.	10
£500 entitled to interest at 8 per cent.	£40

In other words, this operation of exercising the full borrowing powers at the right time, reduces the dividend payable in favor of the gas consumer from 10 to 8 per cent., and this is an important element to be considered in the establishment of new gas companies. It is by no means necessary to fix on a selling price for gas which will pay 10 per cent. on the whole absolute capital, because it has been shown that 8 per cent. on the whole capital will be sufficient for this, in combination with 5 per cent. as the borrowed capital.

As to the price at which gas might be sold in London to pay the utmost Parliamentary dividend on the share capital, supposing that the capital be raised under the most favorable conditions for the gas consumer, that this capital corresponds in amount with that of the most economical company, and also that the annual working expenses do not exceed those of the most economical company:

The Independent has the smallest proportionate capital of any London company, amounting to £4.27 for each ton of coal annually carbonized.

As the whole thirteen companies comprised within the limits of the Metropolis Gas Act carbonized in the year 1861 about 882,000 tons of coal, it follows that their aggregate capital, calculated at the same rate as that of the Independent Company, should only amount to 882,000 x 4.27 = £3,766,140, instead of £5,602,900, the sum at which the capital figures in the last returns presented to Parliament.

Now, supposing the authorized proportion of the capital to be borrowed at five per cent., and the remainder entitled to ten per cent. dividend, this has been already shown to be equivalent to an aggregate capital entitled to divide eight per cent. on the average; hence, £3,766,140 at eight per cent. would be £302,291, which, under this state of things, would be the whole profit to be drawn from the gas consumers of the metropolis. But, according to the last returns, namely, those for the year 1861, the profits actually realized by the thirteen companies amount to £456,305, or £154,000 in excess of that which they would be entitled to on a capital consisting of the same proportionate amount as that of the Independent Company.

Let us further consider this matter in another point of view, namely, to ascertain what should be the absolute selling price of gas in the metropolis, based on a capital such as that of the Independent Company, and taking the working expenses on the same scale as that of the Commercial, which, under the able management of Mr. Robert Jones, works more economically than any other.

	s.	d.
Cost of one ton of coal, after deducting residual products, average working of all the companies	8	0
Cost of manufacture, wages, wear and tear, and all other expenses (exclusive of lighting and extinguishing the public lamps, which a company should never have anything to do with), according to the working of the Commercial Gas Company	9	0
	17	0
Interest at 8 per cent. on £4.27, being sufficient to pay £10 per cent. on share capital and 5 per cent. on borrowed capital	6	10
	23	10

A ton of coal will make ..... 9,300 cubic feet of gas.
Deduct one-sixth for loss by leakage, condensation, and gas used on the works, &c. 1,550
Leaving for sale ..... 7,750 feet.

Then $\frac{28.83}{7750}$ = 3*s.* per 1,000 feet, the price at which gas ought to be sold in London, if only a proper capital were employed, and due economy enforced in the working expenses.

CALCULATION OF THE PRICE AT WHICH GAS OUGHT TO BE SOLD IN LONDON TO PAY 8 PER CENT. ON VARIOUS AMOUNTS OF CAPITAL.*

	When the capital per ton of coal annually carbonized amounts to £4	£5	£6	£7
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
Cost of one ton of coal	0 16 0	0 16 0	0 16 0	0 16 0
Manufacture of gas per ton of coal, including all expenses of wear and tear, wages, establishment charges, &c †	0 12 0	0 12 0	0 12 0	0 12 0
Int. at 8 per cent. on capital	0 6 5	0 8 0	0 9 7	0 11 2
	1 14 5	1 16 0	1 17 7	1 19 2
Less residual products ‡	0 8 0	0 8 0	0 8 0	0 8 0
	1 6 5	1 8 0	1 9 7	1 11 2
Cost per 1,000 feet of gas actually sold	0 3 5	0 3 7	0 3 9½	0 4 0

(*To be continued.*)

* Eight per cent. on the whole capital is equivalent to 10 per cent. on the share capital, when half the amount of this is paid up, and one-third borrowed at 5 per cent.

† The aggregate working expenses of the thirteen companies supplying gas to the metropolis is 13.01 shillings per ton of coal. These working expenses, however, include charges in respect of lighting, cleaning, and extinguishing public lamps.—"*London and Its Gas Companies*," *by Samuel Hughes.*

‡ Average of all the Companies.

BRITISH COAL EXPORTS OF 1863.—The statistical returns of the trade of the principal ports in the Bristol Channel for the first six months of the present year have just been published. Although the trade of the past month of June was exceedingly dull, consequent upon the continued scarcity of shipping, Cardiff shows a material increase in the export of coal, but a slight decrease in that of iron, over the corresponding period of last year. There is a small decrease in the trade of Swansea for the past six months, as compared with the corresponding period of 1862. The total exports for the first six months of 1862 and 1861 were:

1861	Coal 523,220	Iron	67,389
1862	605,399		90,260
1863	663,183		88,733

—*London Mining Journal.*

GAS IN ENGLAND.—At Petersborough, the gas company recommend a dividend of 8½ per cent. A lowering of meter-rents, they report, has increased the number of consumers.

At Worcester the price of gas has been reduced to 4*s.* 6*d.*

At Cambridge the gas company have declared a dividend of 5 per cent. for the last six months. They are about to spend a large sum in relaying and enlarging some of their principal mains.

At Boston the condition of the gas company's affairs is said to be very prosperous. They have declared a dividend of 8½ per cent.

The Wolverhampton Gas Company have offered to supply the town authorities with gas at the rate of four or five feet per hour, at 2*s.* 9*d.* per thousand, to fix and maintain a regulator and lava burner and to light, extinguish, and repair, at 16*s.* per lamp

ON DESTRUCTIVE DISTILLATION, CONSIDERED IN REFERENCE TO MODERN INDUSTRIAL ARTS.

BY B. H PAUL, PH.D.

(*Continued from page* 44.)

The next substance which he succeeded in obtaining from tar was a liquid oil, to which he gave the name of eupion. This oil he also found to be a product of the carbonizaton of coal and all organic substances. While paraffin was obtained in least amount from the tar of coal, the liquid oil was obtained in larger amount from this tar than from any other. The oil to which he gave the name of eupion does not appear to have been a distinct chemical substance, but it was perfectly analogous, if not identical with the hydrocarbon oils now used for burning in lamps, except that it was very much more highly refined than those oils are in practice.

Referring to the possible application of this oil, Reichenbach, says, "If it should hereafter be possible to separate eupion from tar sufficiently cheaply, it is probable that it may be applied to useful purposes; for, since it burns brilliantly, without smoke, by means of a wick, it is suitable as an illuminating material, not inferior to the finest oil; it does not grease, nor char the wick, nor thicken by keeping, nor solidify in the cold. Besides this, it is not requisite for any applications in which the oil is not exposed to cold, that the paraffin should be separated from it."

At the conclusion of his first memoir, Reichenbach expressed the hope that the oily substances obtainable by destructive distillation might, from a scientific point of view, receive more attention than they had hitherto, especially since one of them, paraffin, had been ascertained to exist in such abundant quantity in tar, to be capable of being introduced into industrial economy, and to possess characters that would render its extraction easy.

Just at the very time that Reichenbach discovered paraffin, and ascertained that it was a general product of destructive distillation, the same substance was obtained from the native petroleum of Rangoon by Dr. Chiratison, of Edinburgh. He gave it the name of petroline in the first instance, but subsequently recognized it to be the same substance as Reichenbach had produced by destructive distillation of organic substances and coal. Dr. Christison also obtained four different kinds of oil from Rangoon petroleum, different in color, boiling point, &c.

The most important part of Reichenbach's memoirs consists in the very thorough elucidation they give of the phenomena of destructive distillation, as regards the oily products of that operation. It was to these oily products that his attention was exclusively directed, and in the incidental notice he had occasion to take of gas-making, he showed very clearly that the conditions which give rise to the production of gas are very different from, and indeed the opposite of, those which determine the formation of oily products.

In describing the general character of tar or the oily product of destructive distillation, he says: "Tar is not a uniform or definite material, but a mixture of various constituents, which differs according to circumstances. All carbonizable subtances yield tar, but the tar is of different kinds, according to the nature of the material it is produced from.

"Moreover, tar varies in its character, according as it is produced under absolute or partial exclusion of air, according as it is produced in one or other kind of vessel; . . . . it is one thing when it is produced slowly, and another when it is produced rapidly; it is different at the beginning and the end of the carbonization. When the carbonizing heat is high, the tar produced is different from that produced when the carbonization is conducted within the limits of a moderate temperature." He showed that, as a general rule, the production of tar, consisting of oil and paraffin, depends upon the application of a moderate heat, only just sufficient to carbonize the substance operated upon. In treating of the distillation of coal, he especially pointed out that this was the condition most essential for obtaining tar containing oil and paraffin, that by conducting the distillation of coal so as never to allow the retort to become red-hot, he always obtained tar containing eupion, paraffin, and creosote. This was what he termed a "pure tar of carbonization," and to obtain such tar he particularly stated that it should not, at any stage of its formation, be exposed to a higher heat than that sufficient for carbonization. The tar produced at a high temperature, on the contrary, he showed to be entirely different in its nature, whether obtained from coal or any other material. In the first place, it did not yield by re-distillation more than half as much oil as pure tar, and it contained substances which were never present in pure tar obtained at a low temperature. These substances were naphthalin, pitch, and soot, and the tar obtained from coal in the manufacture of gas was found to be of this kind; it was not a pure tar of carbonization, but an impure mixture. The circumstances which gave rise to this great difference between the tar obtained at different temperatures were ascertained and very clearly described. It was shown that naphthalin was not a product of carbonization; that while mere carbonization yielded only oily products, napthalin was produced by the further decomposition of those products under the influence of a higher temperature—that it was a secondary product—and it was shown that the operation of gas-making did not admit of simple carbonization, since a bright red heat was necessary for producing gas. For this reason the tar of gas-works was black and thick and contained naphthalin, because the oil vapors, produced from the coal in the first instance, came in contact with the sides of the red-hot retort, and were thereby decomposed.

Considerable prominence was given to this important difference between the tar produced from coal, at high and low temperatures, in consequence of an opinion expressed by Dumas that naphthalin was a direct product of the distillation of coal, and of the conjecture founded on that opinion that naphthalin existed in coal. This led to the repetition of Reichenbach's experiments, and to the publication of a memoir, in which he satisfactorily showed that coal did not contain naphthlin, and that coal tar did not contain it unless it had been submitted to a high temperature, and partially decomposed. Reichenbach showed, moreover, that naphthalin was obtainable in like manner from the tar of wood, from alcohol, ether, naphtha, and probably even from olefiant gas by exposing these substances to a bright red heat. The accuracy of these observations was recognised by Dumas, who quoted them in his treatise. The general results of these investigations were, that the production of oily substances by destructive distillation was essentially dependent upon the application of a moderate degree of heat; that the constant products of this operation were eupion and paraffin, together with some others that have not yet been turned to account.

Attempts were soon made to apply the knowledge thus obtained for practical purposes. Materials were sought for that would yield oil and paraffin in sufficient quantity to admit of their being worked. The ordinary coal, then in general use, yielded too little of these products, and the first material to which attention was directed was bituminous schist or shale. A variety of this mineral occurring at Vouvant, between Nantes and Rochelle, was examined by Dumas, and found to yield 14 per cent. of oil, and works were established about the year 1830 for the purpose of manufacturing oil from it by M. Selligue. The crude oil obtained from it is described by Dumas as being greenish-brown, and solidifying when cooled in consequence of containing 2 or 3 per cent. of paraffin. He also pointed out the applications to which these products might be turned as a source of light both by burning in lamps and making gas.

Very shortly after this M. Laurent, who had visited the neighborhood of Autun, and suggested the manufacture of these oils, published an account of an Englih schist that had been sent him for examination, and which he had found to yield 20 per cent. of oil by distillation at a low temperature, finally raised to a red heat. In 1833, a patent was taken out in this country by Richard Butler for the manufacture of oil and gas, from bituminous shale, which consisted in an application of the results obtained by Reichenbach, and of the principles he had laid down with regard to destructive distillation. The specification of this patent is interesting from its containing the earliest mention of paraffin, as the product of a manufacturing operation. It is stated that the less volatile portion of the oil, obtained by distillation below a red heat, contained a white colorless substance—a compound of carbon and hydrogen, which separated in small flakes when the oil was cooled. The claim in this specification is for "the production of oils, by distillation or carbonization, from bituminous schistus or shale, and slate, not including slate coal and bituminous sandstone;" and for "the production of gas for illuminating purposes from such oils, or direct from the bituminous schistus or shale, and slate, &c." For the direct production of gas it is directed that "the retorts should immediately be brought to a red heat," while, on the contrary, the heat was to be gradually applied when the object was to obtain oil in the place of gas. It is interesting here to notice that the main principle of distillation at a low temperature for the purpose of obtaining oils, was fully recognised and applied in the method proposed by Butler, as well as in all subsequent proposals in reference to this manufacture, still the influence of Dumas' authority was recognisably exercised, in this instance, in regard to the exclusion of coal. This, the patentee states, was not to be used because it yielded tar containing naphthalin. That influence is recognisable even at a later period, notwithstanding the fact that in 1835, Dumas has quoted Reichenbach's results as being contradictory of the opinion he had formerly expressed, that naphthalin either existed in coal or was a product of its distillation. It is worth remark, also, that it is uncertain to whom this opinion is due, for M. Dumas, in 1832, ascribes it to Laurent, while Laurent, writing at the same time, ascribes it to Dumas, and Oppermann, also at the same time, says that Reichenbach has decisively proved that naphthalin is produced only by the destruction of the oils by a high degree of heat.

Another patent for a method of effecting the same object was taken out in 1831 by Mollerat.

In 1841, a patent was taken out by Hompesh for "improvements in obtaining oils and other products from bituminous matters, and in purifying and rectifying oils obtained from such matters." The objects of these improvements were to obtain a large quantity of oil, and to improve its quality by removing or greatly modifying the disagreeable smell. The former object was sought to be obtained by a special arrangement devised for very gradually increasing the heat in the distillation of the shale and consequently preventing the decomposition of the oil vapor produced. The means of attaining the second object consisted merely in an amplification of the method already made known by De Saussure for the purification of hydrocarbon oils.

Another patent was obtained in 1845 by Du Buisson, for "New and improved methods for the distillation of bituminous schist and other bituminous substances, as well as for the purification, rectification, and preparation necessary for the employment of the productions obtained by such distillation for various useful purposes." In his specification he says, that though many attempts had been made in England to render bituminous shale useful, they had all failed, while the most important results had been obtained at the works near Autun. His method of treatment consisted in a further application of the principle of distillation at a low temperature, so as to obtain the largest yield of oily products, and to prevent their decomposition into gas by the influence of too high a temperature on this vapor. He proposed to effect this by introducing into the retorts, steam heated by passing it through red-hot pipes, so as to sweep out the oil vapors, and at the same time to admit of the distillation being completed at the lowest possible temperature. The retorts were to be heated externally as before, but the steam introduced was not under pressure, so that while equalizing the temperature of the shale under distillation, and acting mechanically in removing the oil vapors it also kept the temperature from rising so high as to convert them into gas.

About the year 1845, works were erected at Beul, on the Rhine, for the manufacture of oils and paraffin from a mineral that occurs there. It is an imperfect coal, generally known by the name of "brown coal." These works have been in operation since that time to the present.

(*To be continued.*)

REPORTS OF GAS-LIGHT COMPANIES.

PITTSBURGH, PA.

PRESIDENT'S REPORT.

To the Stockholders of the Pittsburgh Gas Co.:

Gentlemen,—I beg leave to present a brief statement of the operation of the works during the past year, and their actual condition, referring for details to the reports of the engineer and treasurer.

The extension of the mains during the past year has been only two hundred and twelve feet. There have been one hundred and ten new services laid, making in all thirty-one hundred and forty-four; and the number of public lights is the same as last year, viz., five hundred and sixty-seven.

The coal carbonized during the year has been two hundred and forty-four thousand nine hundred and seventy-eight (244,978) bushels, being an increase over last year of thirty-four thousand seven hundred and ninety-two (34,792) bushels.

The entire quantity of gas supplied to private customers, public lamps, and city offices, amounted to seventy-seven millions four hundred and ninety-one thousand one hundred and eleven (77,491,111) cubic feet, being an increase over last year of five millions four hundred and nine thousand eight hundred and fifty-five feet.

The sales of coke and tar exceed those of last year; but the present demand for coke is scarcely equal to its production.

The national tax paid for gas made since 1st September last, amounts to $9,282 07, local and State taxation for the year, $6,442 13, which, with $1,800 contributed for public defense and relief of sick and wounded soldiers, make a total of seventeen thousand four hundred and fourteen dollars and twenty cents ($17,414 20), contributed for public purposes by this institution during the past year.

Notwithstanding the heavy taxation, the large increase in the price of labor, and the advance of coal to nearly double its usual rate, the Board hopes to be able to avoid any increase of the price of gas to its customers, without reducing its dividends below a fair and adequate remuneration to the stockholders of the company.

In consequence of the removal from the city of A. B. Berger, Esq., and his resignation of his seat at the Board, the stockholders will be called upod to elect a suitable person to supply his place at the approaching election.

The Board has great pleasure in expressing their continued approbation of the engineer, treasurer, and other employees of the company, and the good order and efficiency of every department of the works.

With renewed desires for the continued prosperity of the company, Your friend and fellow-citizen,

THOS. BAKEWELL, *Prest. Pittsb. Gas Co.*

Pittsburgh, 18th July, 1863.

ENGINEER'S REPORT.

To the President and Board of Trustees of the Pittsburgh Gas Company:

Gentlemen,—The undersigned respectfully presents for your consideration the following statement of the operation and condition of the works under his care, for the year ending June 30, 1863.

The coal carbonized during the year amounts to two hundred and forty-four thousand nine hundred and seventy-eight (244,978) bushels; and the gas distributed to private consumers, public lamps, Mayor's office, water-works, market houses, and consumed in the works, to seventy-seven millions four hundred and ninety-one thousand one hundred and eleven (77,491,111) cubic feet, being an increase of five millions four hundred and nine thousand eight hundred and fifty-five (5,409,855) cubic feet over the amount distributed the preceding year, and within about six per cent. of the average production of the coal carbonized.

The maximum number of retorts in action within the year was fifty-one, and the average number in use during the year was thirty-eight.

The number of men at present employed in all departments of the works is forty-one, and the average number employed during the year was forty-five.

There has been but a small addition made to the extension of street mains within the past year, altogether amounting to only two hundred and twelve feet, as follows:

Pipe laid in Locust street, between Pride and Marion streets	45 feet of	8 in.
" " Seventh st., between Cherry alley and Grant st	36 "	2 "
" " Ferry st., at Front st. (to cross)	26 "	8 "
" " Front st., between Redoubt alley and Ferry st	105 "	2 "
	212	
Mains laid previous to June 30, 1862	161,868 "	
Street mains at present in use 30.69 miles, or	162,080 "	

There have been one hundred and ten services laid within the past year, increasing the number of services to private consumers to three thousand one hundred and forty-four.

There has been no addition to the public lamps within the year, the number remaining the same as at the last annual report, viz., five hundred and sixty seven.

The demand for coke has fallen off within the last three months, until at present the sales amount to rather less than the quantity produced on the works.

The demand for tar continues equal to the production of the works, being disposed of as fast as it is produced.

All departments of the works are at present in good condition, capable of producing a large amount of gas beyond the largest amount that has hitherto been required of them, and will require but a moderate expenditure to maintain them in their present efficient condition. Most respectfully submitted,

JAMES THOMPSON, *Engineer.*

Office of Pittsburgh Gas Co., June 30, 1863.

MANUFACTURING EXPENSES.

Pittsburgh Gas Company, June 30, 1863.

Dr.

To Stock on hand			$5,257 72
Wages	$21,989 36		
Retorts, Castings, &c	2,000 29		
Coal and Slack	12,487 12		
Lime	859 59		
Lead, Oil, Paints, &c	60 82		
Printing, Advertising and Stationery	154 10		
Taxes	4,434 13		
Insurance	19 00		
Lumber	82 75		
Hardware	48 49		
Chloride of Calcium	56 85		
Sand Stone	41 38		
Hauling	125 51		
Hose and Harness	37 78		
Petty Cash	621 09		
Repairs	2,788 80		
Salaries	3,600 00		
			49,356 56
			$54,614 28

Cr.

By Stock on hand		$6,149 30
Sundry persons, for Wages, &c		558 50
Cash for old Retorts and Castings		205 65
Profit and Loss		47,700 83
		$54,614 28

PROFIT AND LOSS.

Pittsburgh Gas Company, June 30, 1863.

1863. Dr.

Jan. 1. To Dividend No. 32, Jan. 1863, two dollars and fifty cents per share	$18,980 00		
Dividend No. 33, July, 1863, two dollars and fifty cents per share	18,980 00		
			$37,960 00
State tax on Dividends	$1,898 00		
U. S. Excise Tax on Gas	9,282 07		
State, County, Bounty, School, Relief, City, Business, Poor and Paving Taxes	4,434 13		
Donations for Home Defence, Sanitary and Subsistence Coms	1,800 00		
			17,414 20
Manufacturing Expenses per act	$47,700 83		
Less State, County, and other Taxes, as above	4,434 13		
			43,266 70
City of Pittsburgh for Gas, credited on act			9,136 99
Sundry persons for balances			563 73
Balance			12,880 50
			$121,222 12

1863. Cr.

July 1. By balance			$5,057 63
1863.			
June 30. By Gas, for 65 097,300 cubic feet of gas to private consumers	$89,054 64		
For 13,078,615 cubic feet to public lamps, Mayor's office, &c	9,805 19		
			98,859 83
Coke and Tar, for proceeds	$16,897 26		
Fittings rented, "	135 00		
Rents of Real Estate, "	240 00		
Interest on County Warrants, &c	32 40		
			17,304 66
			$121,222 12

BALANCES.

Pittsburgh Gas Company, June 30, 1863.

Dr.

To Works	$169,890 44	
Distribution	104,939 84	
Real Estate	54,810 72	
		$329,640 50
Extension Fund		8,612 58
Meters		15,370 97
Fittings Rented		436 84
Stock on hand		8,357 06
City of Pittsburgh		135 49
Sundry persons		1,817 88
Cash		58,081 11
		$422,402 43

Cr.

By Capital Stock	$379,600 00
Dividends Nos. 30, 31, 32 and 33	19,557 50
Advances for Gas to be supplied	3,033 15
State of Pennsylvania for Taxes on Dividends	1,897 35
National Tax, for balance unpaid	1,875 91
Sundry persons, for Coal and Slack	3,557 92
Profit and Loss	12,880 50
	$422,402 43

Trustees of the Pittsburgh Gas-Light Company.

GEORGE ALBREE, JOHN HOLMES,
THOMAS BAKEWELL, N. HOLMES,
ROBERT BEER, J. W. VANDEVORT,
GEORGE BLACK, E. BRADFORD TODD,
A. B. BERGER.

President..... THOMAS BAKEWELL.
Secretary..... GEORGE BLACK.
Treasurer..... JAMES M. CHRISTY.
Engineer..... JAMES THOMSON.

NEW SAFETY LAMP.—The English journals speak of a new safety lamp for miners' use, which has been recently invented by Mr. Isaac M. Evans, of Cefn Mawr, Denbigh, the object being to provide a glass-sided lamp, which shall be as safe as the ordinary gauze lamp, and give a larger amount of light than any yet devised. The lamp may be described as somewhat upon the principal of the Stephenson; for, in the event of the air becoming dangerously foul, it goes out. The flame is inclosed within two glasses, the inner one being thin, and the outer one of sufficient strength to bear almost any amount of hard usage. At the top is a double gauze-cone, and the air is admitted below, through extremely small orifices. It will be seen that, from the construction of the lamp, the outer glass could never become heated, and that the inner glass will admit of ample expansion; there can be no doubt either, that, while the lamp is burning, there is a continual upward current of cool air between the glasses.

COAL TAR COLORS.—It has been known for some time that Dr. Hofmann had taken up the subject of the industrial colors producible from coal-tar. The great practical chemist is still pursuing his researches, and he has just stated that he has found that a mixture of pure aniline and toludine, heated with a mercurial or stannic chloride, or with arsenious acid, produces instantaneously a splendid red, of intense dyeing power. In following out his inquiries, Dr. Hofmann has also turned his attention to the manufacture of toludine in a pure state, and he can now produce it quite pure, and what is far more to the purpose, in great quantities. These practical experiments are still going on, and with the great abundance of material before him, with the most satisfactory hopes. As regards the black of aniline, it is interesting to find in the *Repertorie de Chimie* a specimen of cotton dyed with it. It is a fine black, and was obtained by the action of oxydising substances upon aniline. It resists the action of light, boiling soap suds, chlorine, acids, and alkalis.

COAL-BEDS.—Heath's mine in Virginia is represented to contain a coal-bed fifty feet in thickness; a coal-bed near Wilkesbarre, Pa., is said to be twenty-five feet thick; at Mauch Chunk is a coal-bed forty to fifty feet deep, and in the basin of the Schuylkill are fifty alternate seams of coal, twenty-five of which are more than three feet in thickness. In Nova Scotia is a coal formation fourteen hundred feet deep, and containing seventy-five alternate layers of coal. The Whitehaven coal mine, in England, has been worked two hundred feet deep, and extends a mile under sea, and the Newcastle coal in the same country has been worked to the depth of 1,500 feet, and bored to a similar additional depth without finding the bottom of the coal measure.

PATENTS.

UNITED STATES.

39,342.—W. H. Gwynne, White Plains, N. Y., for Carburretting Gas from Steam and Hydro-carbons. Antedated Jan. 19, 1863:

I claim making illuminating gas from water and hydro-carbons, by passing the water gas through any liquid hydro-carbon, contained in a reservoir, attached to a gas-fixture.

39,350.—William P. McConnell, Washington, D. C., for a Process for the Manufacture of Illuminating Gas:

I claim the improvement herein described in making illuminating gas from petroleum or coal-oil, viz., subjecting the products of destructive distillation therefrom to a high degree of heat, substantially in the manner and for the purposes herein set forth.

39,387.—William Elmer, of New York City, for an apparatus for producing Olefiant Gas. Ante dated May 13, 1863:

I claim constructing the apparatus for producing pure olefiant gas and oxide of zinc, by arranging contiguous and indirect connection and communication with the retort, A, for containing granulated zinc, and the pre-heater, Z, for converting naphtha or benzole and water into vapors and arranging and combining therewith the several gas-pipes, D F K N M P Q, cocks, I H P, cylinders, G L, and reservoir, O, for performing the respective functions before described; the several parts operating distinctively to produce the desired results, substantially in the manner herein set forth.

39,388.—William Elmer, of New York City, for a process for producing Illuminating Gas. Ante dated May 3, 1863:

I claim the production of pure olefiant gas from benzole or naphtha and water, in conjunction with zinc, by pre-heating the former substances so as to form vapors, and bringing said vapors into contact with a certain quantity of metallic zinc, heated to the requisite degree, as herein set forth.

Also, the continuous process in the manufacture of olefiant gas, in which the gas is not decomposed; and the production of oxide of zinc by the decomposition of the vapors of water, as herein described.

39,391.—John Goland, of Batavia, Ill., for a Pump:

I claim the valve, B, in the bottom of the cylinder, A, in combination with the hollow piston, C, provided with the valve, D, and perforated at its upper part, as shown at f, all arranged to operate as and for the purpose set forth.

39,393.—W. H. Gwynne, of White Plains, N. Y., for a method of producing Gas from Water:

I claim producing gases for heating and lighting and other purposes by decomposing highly heated and finely divided jets of steam by means of anthracite coal, substantially as herein set forth and described.

39,399.—John S. Hull, of Cincinnati, Ohio, for a Lamp Burner:

I claim the inner cone partition, C, arranged in the inside of a lamp burner, in combination with the perforations, a a, of the outer case, substantially as and for the purpose herein specified.

I also claim the notches or scallops, c c, in the lower edge of the partition, C, for the purpose designated.

39,400.—John S. Hull, of Cincinnati, Ohio, for a Lamp Burner:

I claim introducing the draught air by first descending, from the outside, into a separate or enclosed chamber, c, and thence ascending through a perforated partition or "cone," B, into the burner chamber, in combination with a flat wick tube, substantially as and for the purpose herein specified.

39,413.—John McHenry, of Cincinnati, Ohio, for a Lamp Burner:

I claim the supplemental cap, E, constructed as described, and applied to the wick tube, D, within the cone or deflector, C, in manner substantially as and for the purposes set forth.

39,438.—M J. Wellman, of New York City, for a Lamp or Gas Shade. Ante dated May 19, 1863:

I claim the employment of opening screens in combination with the shades, as and for the purpose set forth.

39,446.—Seth H. Ingalls, of New Bedford, Mass., assignor to himself, Joshua K. Ingalls & Wm. S. Sampson, of New York City, for an Oil Tank:

I claim, first, The tank arranged substantially as specified, for the purpose of holding oils, &c., under water, so as to sustain the oils against the top of the tank, by the pressure of water, and thereby prevent all possibility for accumulation of gases or vapors, and all danger of fire or explosion therefrom.

Second, I claim the method substantially as specified for introducing and discharging the oils by hydraulic force.

39,448.—Oscar H Kratze, of Leipsic, Saxony, assignor to Ferdinand F. Mangelsdorf, of Stapleton, N. Y., now of New York City, for a Gas Engine:

I claim, first, The arrangement of the cone, e, covered with some absorbent material, in combination with the adjustable cone, f, and cylinder, A, constructed and operating in the manner, and for the purpose substantially as described.

Second, The arrangement of one or more layers of wire gauze in the induction ports, substantially as and for the purpose set forth.

39,471.—Hosea Elliot, New York city, for Lighting Street Lamps:

I claim the arrangement of the tilting lamp, A, in combination with the case, C, self-closing door, d, pole, B, and thumb-piece, D, all constructed and operating in the manner and for the purpose substantially as shown and described.

39,480.—W. H. Gwynne, White Plains, N. Y., for the Manufacture of Water Gas:

I claim passing steam, superheated or otherwise, through melted metal or ores, for the purposes described and shown.

39,488.—Louis Loeffler (citizen of Prussia), East Cambridge, Mass., for a Lamp:

I claim the combination of a lamp or burner, a piece of spongy platinum, or its equivalent, and an apparatus for the generation of hydrogen gas, and discharge of such gas, on the said piece of spongy platinum, the whole being substantially as and for the purpose above specified.

39,498.—Robert Safely, Cohoes, N. Y., for a Water-Wheel:

I claim the hollow beam, H, in combination with the stuffing-box, J, and the oil-cup, O, arranged and fitted substantially as described and for the purposes set forth in this specification.

39,524.—Joseph Dodin, Brooklyn, N. Y. (assignor to James Edgar, of Bergen, N. J.), for a Lamp-Burner:

I claim, first, The particular shape of the plate of metals, figures 3 and 4, with their openings, e.

Second, The shape of the plate, figure 5, with the mode of fastening it to the plate, figures 3 and 4, at a, figures 3, 4, and 5.

Third, The shape of the plate, figure 6.

Fourth. The mode of fastening the cone, b, figure 1, to the base, G, figure 2, substantially as described.

39,540.—Joseph Banks, New York city, for a Rotary Pump:

I claim, first, Arranging the valves, G G', in slots or recesses, in the edges of the pistons, F, as and for the purpose shown and described.

Second, The springs, b b', under the valves, G G', when the same are used in combination with pistons, F, connected by stems, a, in the manner and for the purpose substantially as specified.

39,551.—C. E Corbitt, Corbettsville, N. Y., for a Coal-oil Lamp:

I claim surrounding the tube of the ordinary coal-oil lamp with packing of cotton or other porous substance, as and for the purposes described.

39,568.—C. B. & J. Hardick, Brooklyn, N. Y., for a Valve for Pumps:

We claim the stops, p, extending from side to side of the valve-chest over the seat, and receiving the cylindrical or prismatic valves, as specified.

39,574.—Lewis Hover, Chicago, Ill., for a Case for a Ratchet Wheel for Lamps:

I claim, first, The described manner of securing the cap on the wick-tube or burner, by inserting one or both ends of said cap in perforations made in the burner for that purpose.

Second, I claim one or more perforations made in the burner for the insertion of the ends of the cap, and thus constituting a fastening for said cap, as explained.

Third, I claim the cap herein described, when one or both ends are made to act as a spring or wick sustainer, as explained.

PATENT AGENCIES.

SCIENTIFIC AMERICAN OFFICE, New York City—37 Park Row, Washington, D. C.—F and 7th Sts.

MESSRS. MUNN & CO., publishers of the Scientific American and Patent Solicitors for the last seventeen years, would announce to the public that they never possessed better facilities for obtaining Letters Patent and transacting all kinds of business before the Patent Office than they now have.

During the *seventeen years* they have been engaged in procuring patents they have acted as Attorneys for more than seventeen thousand patentees. Nearly one-third of all the applications for patents annually made in this country are conducted through the "Scientific American Patent Agency," and nearly all the patents secured abroad by American citizens are taken through this Office.

In making an application for a patent, all the inventor is required to do is to furnish a model with an explanation of the operation and advantages claimed. The drawings, petition, specification and other papers are prepared and presented at the Patent Office by Munn & Co., who have a large corps of engineers, draughtsmen, specification writers and copyists in constant employment. Papers prepared at short notice.

Pamphlets of instruction, announcing the amount of fees, size of model, and other information as to the best made of obtaining patents in this and all foreign countries, are furnished free on application. For further particulars address

MUNN & CO.,
Publishers of the "Scientific American,"
No. 37 Park Row, New York.

ESTABLISHED 17 YEARS.

OFFICE FOR THE PROCURATION of Letters Patent and the Registration of Designs. JOSEPH WILLCOCK & CO., Patent Agents and Engineers, successors to Messrs. Barlow & Co., 89 Chancery Lane, London, W. C.

Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d.

The second part is approaching completion and will shortly be announced.

AMERICAN AND FOREIGN Patent Agency, Established 1838. Letters Patent for New Inventions procured in the United States, Great Britain, France, and other countries. LEMUEL W. SERRELL, 119 & 121 Nassau St., New York.

MESSRS. J. WRIGHT & CO., Consulting Engineers and Solicitors of Patents, No. 42 Bridge street, Blackfriars, London, E. C. Patents for inventions obtained in all countries where Patent Laws are in force.

J. N. McINTIRE, Patent Attorney and Solicitor of American and Foreign Patents, Office, No. 37 PARK ROW, New York City.

PATENT AGENCIES.

F. C. TREADWELL, Junr., Solicitor of Patents, And expert in Patent Cases, 335 BROADWAY, (Moffat's Building.) New York.

GAS-FIXTURES.

Mitchell, Vance & Co.,
Manufacturers of
CHANDELIERS,
And every description of
GAS FIXTURES,
WAREHOUSE, No. 620 BROADWAY.
MANUFACTORY,
Nos. 335, 337, 339, 343 West 24th Street, New York.

GEORGE H. KITCHEN & CO., Manufacturers of
Fixtures for Gas-Light Purposes,
Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

BOOKS FOR GAS ENGINEERS.

A Treatise on Gas-Works and the Practice of Manufacturing and Distributing Coal-Gas. By Samuel Hughes, Civil Engineer.

Report of the Proceedings of Both Houses of Parliament on the Metropolitan Gas Bill.

The Chemistry of Gas-Lighting. By Lewis Thompson, Consulting Chemist.

A few copies of the above books, invaluable to gas engineers, are for sale at the Rooms of the American Gas-Light Journal, No. 89 Nassau st., New York City.

Gas Legislation, being a copious Index to the Metropolis Gas Act of 1860. By Samuel Hughes, C. E.

Gas Engineers who may want any scientific books will be promptly supplied at publisher's prices, by sending their orders, accompanied by the money, to this office.

FINANCIAL.

JOHN MOSS, Jr.,
BROKER.
53 WALL STREET, NEW YORK,
Particular attention given to the negotiation of GAS-LIGHT and WATER COMPANIES SHARES and BONDS.

ALBERT H. NICOLAY,
STOCK BROKER AND
AUCTIONEER.
No. 52 William Street,
Near Wall St., New York.
Special attention given to the Buying and Selling of Gas-Light Companies' Stocks.

JOHN B. MURRAY,
No. 39 NASSAU STREET,
Opposite the Post Office, New York,
OFFERS FOR SALE
GAS-LIGHT STOCKS
In all the leading Companies.

GAS & WATER-METERS.

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
Manufacturer of
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

H. R. WORTHINGTON'S
PATENT WATER-METER.
This Meter combines
ACCURACY, SIMPLICITY, and
REMARKABLE DURABILITY,
with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

ANALYTICAL CHEMIST.
C. ELTON BUCK,
Analytical and Consulting CHEMIST,
39 NASSAU STREET, NEW YORK,
Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

PROPOSALS.

PROPOSALS FOR CONSTRUCTING A BRICK TUNNEL UNDER LAKE MICHIGAN, TWO MILES LONG, FOR THE CITY OF CHICAGO.

Office of the Board of Public Works, Chicago, August 13th, 1863.

Sealed proposals will be received at this office till Wednesday, September 9th, at 11 o'clock, A. M., at which time the Board will open the same, for doing all the work and furnishing all the materials required for the construction of a brick tunnel, five feet clear diameter, and extending from the present pumping works of the city, two miles out, under the bed of Lake Michigan, and through what numerous borings invariably show to be a stiff blue clay soil, together with land and lake shafts, and protecting cribs, in accordance with the plans and specifications for the doing of said work, to be found on file in the office of this Board on and after the 19th inst.

The Board would prefer to let the entire work to one contractor or company, but will receive separate proposals for the tunnel proper and land shaft, for the protecting cribs, and for the cast iron cylinders for lake shafts.

The Board reserves the right to reject any or all bids, and to accept any one bid complying with the conditions of this advertisement.

The bids must be sealed, and must be accompanied with a bond of the penal amount of $200, blanks for which will accompany the specifications, guaranteeing the execution of a contract in accordance with the bid, in case the bid is accepted.

Proposals must be directed to the Board of Public Works, and indorsed "Proposals for Lake Tunnel."

Satisfactory security for the faithful performance of the work will be required of the parties whose bids may be accepted.

J. G. GINDELE,
FRED. LETZ,
F. C. SHERMAN,
Board of Public Works.

OFFICIAL.

THE COMMITTEE ON LAMPS and Gas of the Board of Councilmen, will meet EVERY WEDNESDAY at 1 o'clock P. M., until further notice, in room No. 15, City Hall, for the purpose of investigating all papers referred to them. All persons interested are respectfully requested to appear before the Committee without further notice.

ALEX. BRANDON,
JAMES MURRAY,
RICHARD O'BRIEN. } Committee of Lamps and Gas.

THE COMMITTEE ON SEWERS of the Board of Aldermen will meet EVERY WEDNESDAY, at 2 o'clock P. M., in room No. 8, City Hall. Parties interested in any matter before the Committee will have an apportunity of being heard.

GEO. A. JEREMIAH,
TERENCE FARLEY,
CHARLRS H. HALL,
Committee on Sewers.

VAN KIRK & CO.

Manufacturers of

CHANDELIERS, GAS FIXTURES, &c.,

Bronze Figures & Ornaments, Porcelain & Mica Shades,

COAL OIL BURNERS,

HAND LAMPS, COLUMNS, &c.,

No. 517 ARCH STREET, PHILADELPHIA.

Factory at Frankford, Philadelphia.

ALL GOODS WARRANTED.

DIETZ & CO.,

MANUFACTURERS, EXPORTERS AND DEALERS IN LAMPS,

And all Goods appertaining to the Lamp Trade,

132 WILLIAM STREET, NEW YORK.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
179 BROADWAY, N. Y.

GAS-BURNERS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS,
And Importer of SCOTCH TIPS,
No. 447 BROOME ST.,
Second door west of Broadway, New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers. &c., &c.

ORNE'S PATENT FILTER REGULATING GAS-BURNER,
Admitted by all practical and scientific men who have examined its movements, to be
THE BEST GAS-BURNER YET INVENTED.
They are
Self-Regulating,
Gas-Purifying,
Indestructible, and
Most Economical.

For sale by—
S. A. STETSON & Co.,
350 WASHINGTON STREET,
Boston, Mass.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' PROVING APPARATUS, &c.
No. 111 South Eighth St.,
Philadelphia.

PETROLEUM GAS.

THE AUBIN GAS-WORKS COMPANY, OF ALBANY, N. Y., have adapted their Works to petroleum and the heavy oil obtained from its distillation. Parties desiring information will be referred to Village Gas-Works thus adapted, where the ordinary yield of gas is from 150 to 200 cubic feet per gallon of oil. This yield, and the great improvements which experience has added to the Aubin Works, enable them to make a rich gas at a low cost—the only way to compete with kerosene.

A. CARR, MANUFACTURER AND DEALER IN WROUGHT AND GALVANIZED IRON PIPE, BRASS COCKS, VALVES, &c., and all descriptions of FITTINGS FOR STEAM, WATER and GAS,
135 MERCER STREET, New York.

WOOD GAS.

THE INVENTOR AND PATENTEE of a New and Improved Retort for Manufacturing Gas from Wood, Turf, &c., would call the attention of Gas Companies, and the public generally, to an invention which will be a great saving to the community, as they can thereby supply an exceedingly cheap, clear, and brilliant light, besides useful products in profusion. The Works can be seen in successful operation at the Cremorne Gardens, Fourteenth street and Sixth avenue, on application at the office of the Patentee, No. 23 Liberty street, New York, and where any information may be obtained, and where Companies or private individuals wishing to purchase rights for Hotels, Factories, Private Houses, Cities, Counties, or States, will please apply.

WOODEN PURIFYING TRAYS.

PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.

CAUTION
TO
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago,
Louisville,
And numerous others.

Orders received by mail or otherwise.
JOHN L. CHEESMAN,
147 Ave. C, New York City.

CLAY RETORTS.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty-third streets, Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

IRON FOUNDRIES.

MORRIS, TASKER & CO.,
PASCAL IRON WORKS,
[ESTABLISHED 1821.]
PHILADELPHIA.
Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues,
GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
Gas and Steam Fitters' Tools, &c.
STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

BERGEN IRON WORKS,
Established 1833.
R. A. BRICK, Manufacturer of CAST IRON WATER and GAS-PIPES RETORTS, PIPES, &c., always on hand. Office, 109 Leonard Street, New York.

S. FULTON & CO., (Successors to Colwell & Co.) Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, also Heavy and Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.
SAMUEL FULTON, THEO. TREWENDT.

FLORENCE IRON WORKS.—The subscriber is prepared to execute orders and make contracts for Cast-Iron Water and Gas-Pipes, from 2 inches to 48 inches in diameter; also, Retorts, Bench-Castings, Branches, Bends, and all Castings for Water or Gas-Works. Pipes and Castings coated with Smith's Patent Coal Tar Varnish to prevent corrosion.
JOSEPH G. JONES,
205½ Walnut Street, Philadelphia.

THE ALPHA TUBE WORKS,
WALSALL, STAFFORDSHIRE, ENGLAND,
Established 1830.

LAMBERT BROTHERS,
Manufacturers of
LAP-WELDED BOILER TUBES, LOCOMOTIVE AND MARINE ENGINE FITTINGS,
Wrought Iron Welded Pipe;
FOR STEAM OR HIGH-PRESSURE WATER AND GAS;
HIGH-PRESSURE STEAM AND WATER VALVES,
FIRE & GARDEN ENGINE WORK, PUMPS, HYDRANTS, WATER-CLOSETS,
Iron and Brass Gas-Fittings, Gaseliers, &c.
AND OF THE GROVE BEDSTEAD WORKS, WALSALL.
Delivery Free, in Liverpool, &c.
Catalogues post free.

POOLE & HUNT, BALTIMORE, MD., are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.

J. VAUGHAN MERRICK, JOHN E. COPE. W. H. MERRICK,

SOUTHWARK FOUNDRY,
FIFTH & WASHINGTON STREETS,
PHILADELPHIA.
MERRICK & SONS, Engineers,
MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

THE GROVER & BAKER SEWING MACHINE, everywhere triumphant. This Machine has taken the First Premium at the State Fairs last held in

New York,	Missouri,
New Jersey,	Kentucky,
Ohio,	Tennessee,
Indiana,	Virginia,
Illinois,	North Carolina,
Michigan,	Alabama,
Iowa,	California,

Including every State Fair at which it has been exhibited in 1862.

The Work made on the Grover & Baker Machine has taken the First Premium at every Fair in the United States where it has been exhibited to this date. GROVER & BAKER S. M. CO.,
495 Broadway, N. Y.

OUR AGENTS.

AGENTS OF
The American Gas-Light Journal,
From whom it can be purchased in single copies or by the year.
TERMS—$3 per annum. Single copies 15 cents.
Liberal discount to Dealers.

ALBANY, N. Y.	Thomas Hastings, P. L. Gilbert, Wm. J. Bell.
BOSTON, Mass.	D. Howard. Jr., Cushing & Bowen.
BRIDGEPORT, Ct.	News Agent at R. R. Station.
BUFFALO, N. Y.	T. G. Hawks, B. F. Felton, D. Lockwood.
CARMANSVILLE, N. Y.	W. Cameron.
CATTSKILL, N. Y.	W. Van Loan.
CHICAGO, Ill.	J. McNally, J. R. Walsh, Shear & Co.
CLEVELAND, O.	Hawks & Bros.
COLDSPRING, N. Y.	A. Tenant.
DOBBS' FERRY, N. Y.	E. Ackerman.
ELIZABETH, N. J.	R. Caldwell, Wm. Gale.
ELMIRA, N. Y.	M. B. Brink.
FALL RIVER, Mass.	L. J. Moroo.
FISHKILL LANDING, N. Y.	J. R. Van Slyke.
FISHKILL VILLAGE, N. Y.	B. Stanbach.
FORT WASHINGTON, N. Y.	J. Maloney.
FRANKLIN, N. Y.	G. W. Reynolds.
GALENA, Ill.	G. H. Schenck.
HARTFORD, Ct.	D. C. Pond, C. J. Geer.
HASTINGS, N. Y.	D. Crane.
HENSDALE, Pa.	A. G. Forbes.
HUDSON, N. Y.	G. Parton.
HYDE PARK, N. Y.	J. N. De Graff.
JAMESTOWN, N. Y.	G. W. Hazletine.
KINGSTON, N. Y.	C. Van Buren.
MILBURN, N. J.	W. Hastings.
MORRISTOWN, N. J.	J. West, J. R. Runyon.
NEWARK, N. J.	Agens & Co., J. R. Jillison.
NEWBURG, N. Y.	W. H. Callahan, J. M. Martin, P. C. Daly, G. P. Lomas.
NEW HAVEN, Ct.	E. Downs, T. H. Pease.
NEWPORT, R. I.	B. J. Tilley.
NEWTOWN, N. J.	H. Warren.
NYACK, N. Y.	H. Hazelbarth.
PEEKSKILL, N. Y.	J. A. Green.
PHILADELPHIA, Pa.	V. H. Myers, 152 South Fourth street.
PITTSBURG, Pa.	J. W. Fittock, Henry Miner, L. P. Hunt.
POUGHKEEPSIE, N. Y.	J. H. Bush, W. Patrick, G. Williamson.
PROVIDENCE, R. I.	D. Kimball,
RAHWAY, N. J.	W. H. Neefers.
RONDOUT, N. Y.	A. M. Barbes, Winter Bros.
SARATOGA SPRINGS, N. Y.	A. Hill.
SAUGERTIES, N. Y.	T. J. Barrett.
SING SING, N. Y.	F. Bushers.
SOMMERVILLE, N. J.	C. Barkalow.
STAMFORD, Ct.	G. R. Treate. News Agent at R. R. Station.
ST. JOHNSVILLE, N. Y.	G. A. Russell.
SYRACUSE, N. Y.	J. H. Green.
TARRYTOWN, N. Y.	C. De Riviere.
TOLEDO, O	L. C. Shear.
TROY, N. Y.	L. Willard, J. F. Hoyt.
WASHINGTON, D. C.	Frank Taylor, P. De Vine, Kirkwood House, News Agent Willard's Hotel.
WATERBURY, Ct.	D. J. Bishop.
WELLSVILLE. N. Y.	Wm. Patton.
WEST POINT, N. Y.	H. N. Sheerar, R. A. Grand, opposite West Point.
YONKERS, N. Y.	D. Burns, John Featherstone.

General Agents in New York City.

ROSS & TOUSEY, 121 Nassau Street.

H. DEXTER & Co., 113 Nassau Street.

OKIE, DAYTON & JONES, cor. Ann and Nassau Sts.

L. N. SHEAR & Co., 55 Hudson Street.

HAMILTON, JOHNSON & FARRELLY, 22 Ann Street.

J. F. FEEKS & Co., 24 Ann Street.

F. S. THOMSON, New Haven Railroad Station, 27th Street.

THOMAS FITZGIBBONS, New Jersey and Amboy Railroads.

ALEXANDER CRAW, Harlem Railroad Station, 26th Street.

WM. SKELLY, Greenwich Street, Erie Railroad Station, Duane Street.

In Canada.

THE AMERICAN GAS-LIGHT JOURNAL can be ordered through any of the News Agents in either of the Canadas.

In Great Britain.

Terms 12s. per annum, single copies 10d.
TRUBNER & Co., 60 Paternoster Row, London.

In France.

Terms 15 Frs. per annum.

Bureau of *Le Journal de l'Eclairage au Gaz*, Boulevard de Poissonniere, No. 24, Paris.

ROOMS IN NEW YORK.—No. 30 Nassau Street, opposite the Post Office.
Terms—$3 per annum. Single copies 15 cents.

THE AMERICAN METER CO.,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer.

Trustees.

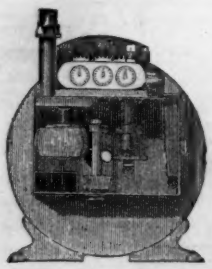
SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS and REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy, and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

340 WEST TWENTY-SECOND STREET, NEW YORK,
1504 FILBERT STREET, PHILADELPHIA,
1 BARRETT STREET, BOSTON, will meet with prompt attention.



HARRIS & CO.,

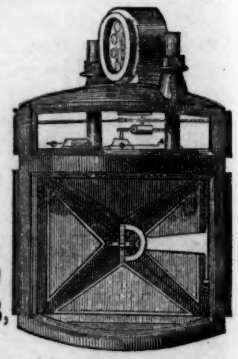
(LATE HARRIS & BRO.,)

N. W. CORNER 13TH & CHERRY STREETS,

PHILADELPHIA,

MANUFACTURERS OF

WET AND DRY GAS-METERS.



METER PROVERS, CENTRE SEALS, PHOTOMETERS, GOVERNORS, STATION METERS,
EXPERIMENTAL METERS, PRESSURE REGISTERS, PRESSURE GAUGES, &c., &c.

The firm of Harris & Co., which comprises the senior partner and only practical Meter maker of the late firm of Harris & Bro., will continue the manufacture of Meters, &c., of every description, and will guarantee to furnish an article of Meters equal to the best in the country, at the lowest rates, and combining the latest improvements with great durability and accuracy. The reputation of the Meters of the late firm of Harris & Bro. is confidently appealed to. All our Meters are tested by a sworn Inspector. Terms Easy.

HARRIS & BROTHER,

PRACTICAL GAS METER MANUFACTURERS,

Continue, as heretofore, at their old Establishment,

No. 1117 CHERRY ST., PHILADELPHIA,

TO MANUFACTURE
WET AND DRY GAS METERS (Consumers'),
STATION, EXPERIMENTAL AND SHOW METERS,
GLAZED METERS, METER PROVERS, AND PHOTOMETERS,
GOVERNOR AND CENTRE SEAL DRUMS,
FLUID AND PRESSURE GUAGES,
PRESSURE REGISTERS AND INDICATORS, &c., &c., &c.

All our work warranted. All orders addressed to
HARRIS & BRO., 1117 Cherry Street, Philadelphia.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 Liberty Street, New York.

Local Agents—S. R. Williams, 204 South Front st., Philadelphia.
Calvin Gay, 29 Doane st., Boston.

PROTECTED WROUGHT-IRON WATER & GAS PIPE,

HYDRAULIC CEMENT SEWER PIPE,

KNIGHT, WOODWARD & CRAWFORD,

Office, Cor. Reade & Centre Sts., New York.

Sewer Pipes extensively used in Brooklyn, and now introduced in New York, Jersey City, Newark, Hartford, Albany, and other localities, from 3 to 24 inches in calibre.

Water Pipes, lined and coated with Cement mortar, ready for laying and back filling, and can be tapped like cast-iron pipes, which they excel in durability, discharge, and economy.

Factories { Cor. Bond & Union sts., Brooklyn. " Washington & South 8th sts., Jersey City.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER & CO., office 56 Goerck street, corner Delancy street, New York.

Gas-House Tiles and Fire-Brick of all shapes and sizes. Fire Mortar, Clay, and Sand articles of every description made to order at the shortest notice. B. Kreischer, M. Maurer, A. Weber.

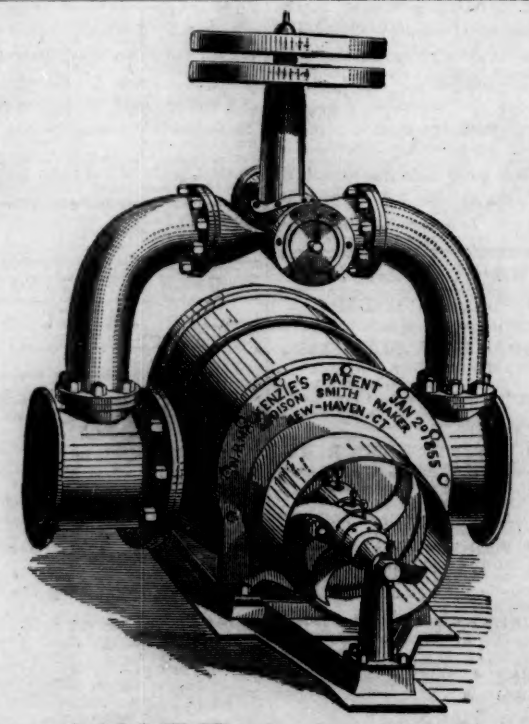
THE AMERICAN

PETROLEUM COMPANY,

OF THE CITY OF NEW YORK;

No. 10 Pine Street.

W. W. CLARKE,
Vice-President.



SMITH & SAYRE,

Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address SMITH & SAYRE, 458 Broadway, New York.

NEWSPAPER WRAPPERS. Mara's Patent Self Sealing and Folding Water-lined Newspaper Wrappers, $1.50 per 1000. Sold by
HAMILTON, JOHNSON & FARELLY,
22 Ann st., New York.

CLARK'S PATENT STEAM AND Fire Regulator Co., sole Patentees and manufacturers of CLARK'S PATENT STEAM AND FIRE REGULATOR, No. 5 Park Place, New York.

W. H. Perrine, Pres.